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A Comparison of Achievements of Westland and Other Schools in Silent Reading, Arithmetic and Language

William M. Stafford

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A COMPARISON OF ACHIEVEMENTS OF WESTLAND
AND OTHER SCHOOLS IN SILENT READING,
ARITHMETIC AND LANGUAGE.

BY
WILLIAM MERRITT STAFFORD

A THESIS SUBMITTED TO THE GRADUATE COMMITTEE
IN PARTIAL FULFILLMENT OF THE REQUIRE-
MENTS FOR THE DEGREE OF MASTER OF
SCIENCE IN EDUCATION

COLLEGE OF EDUCATION
BUTLER UNIVERSITY

1932

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ii

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CONTENTS

Chapter I	Introduction -----	1
Chapter II	Silent Reading-----	7
Chapter III	Arithmetic-----	35
Chapter IV	Language Usage-----	110
Chapter V	Conclusions-----	124
Appendix	-----	132
Appendix A	-----	133
Appendix B	-----	134
Appendix C	-----	135

LIST OF TABLES

	Page
1. Comparison of Median Scores in Rate in Grade IV.....	18
2. Comparison of Median Scores in Comprehension in Grade IV.....	18
3. Comparison of Median Scores in Rate in Grade V.....	25
4. Comparison of Median Scores in Comprehension in Grade V.....	25
5. Comparison of Median Scores in Rate in Grade VI.....	31
6. Comparison of Median Scores in Comprehension in Grade VI.....	31
7. Median Scores in Rate of Silent Reading in Grade VII of Each School in Comparison With Stone's Standard.....	32
8. Median Scores in Comprehension in Silent Reading in Grade VII of Each School in Comparison with Stone's Standard.....	33
9. Median Scores in Rate in Silent Reading in Grade VIII of Each School in Comparison with Stone's Standard.....	33
10. Median Scores in Comprehension in Silent Reading in Grade VIII of Each School in Comparison with Stone's Standard.....	34
11. Problems Attempted by Grade III, Test I.....	37
12. Problems Solved Correctly by Grade III, Test II	37
13. Pupils in Grade III Solving All Problems Attempted, Test III.....	38
14. Pupils in Grade III Solving No Problems, Test IV.....	38

LIST OF TABLES (Cont.)

	Page
15. Tabulation of Ranks in Grade III.....	39
16. Results in Addition in Grade IV, Test I.....	41
17. Ranking of Schools in each of the Seven Points and on the Whole Test.....	42
18. Results in Subtraction in Grade IV, Test II...	42
19. Ranking of Schools in each of the Seven Points and on the Whole Test.....	43
20. Results in Multiplication in Grade IV, Test III.....	44
21. Ranking of Schools in each of the Seven Points and of the Whole Test.....	45
22. Results in Division in Grade IV, Test IV.....	45
23. Ranking of Schools in each of the Seven Points and on the Whole Test.....	46
24. Results in Addition in Grade IV, Test IV.....	47
25. Ranking of Schools in each of the Seven Points and on the Whole Test.....	48
26. Results in Addition in Grade IV, Test VI.....	48
27. Ranking of Schools in each of the Seven Points and on the Whole Test.....	49
28. Results in Multiplication in Grade IV, Test VII.....	50
29. Ranking of Schools in each of the Seven Points and on the Whole Test.....	51
30. Results in Division in Grade IV, Test VIII....	51
31. Ranking of Schools in each of the Seven Points and on the Whole Test.....	52
32. Summary of Rankings of all Tests in Arithmetic in Grade IV.....	53

LIST OF TABLES (Cont.)

	Page
33. Results in Addition in Grade V, Test I.....	54
34. Ranking of Schools in each of the Seven Points and on the Whole Test.....	55
35. Results in Subtraction in Grade V, Test II....	56
36. Ranking of Schools in each of the Seven Points and on the Whole Test.....	57
37. Results in Multiplication in Grade V, Test III.....	58
38. Ranking of Schools in each of the Seven Points and on the Whole Test.....	59
39. Results in Division in Grade V, Test IV.....	60
40. Ranking of Schools in each of the Seven Points and on the Whole Test.....	61
41. Results in Addition in Grade V, Test V.....	62
42. Ranking of Schools in each of the Seven Points and on the Whole Test.....	63
43. Results in Subtraction in Grade V, Test VI....	64
44. Ranking of Schools in each of the Seven Points and on the Whole Test.....	65
45. Results in Multiplication in Grade V, Test VII.	66
46. Ranks of Schools in each of the Seven Points and on the Whole Test.....	67
47. Results in Division in Grade V, Test VIII.....	68
48. Ranking of Schools in each of the Seven Points and on the Whole Test.....	69
49. Summary of Rankings of all Tests in Arithmetic in Grade V.....	70
50. Results in Addition in Grade VI, Test I.....	71

LIST OF TABLES (Cont.)

	Page
51. Ranking of Schools in each of the Seven Points and on the Whole Test.....	72
52. Results in Multiplication in Grade VI, Test II.....	72
53. Ranking of Schools in each of the Seven Points and on the Whole Test.....	73
54. Results in Division in Grade VI, Test III.....	74
55. Ranking of Schools in each of the Seven Points and on the Whole Test.....	75
56. Results in Subtraction in Grade VI, Test IV...	75
57. Ranking of Schools in each of the Seven Points and on the Whole Test.....	76
58. Results in Addition and Subtraction of Fractions in Grade VI, Test V.....	77
59. Ranking of Schools in each of the Seven Points and on the Whole Test.....	78
60. Results in Multiplication and Division of Fractions in Grade VI, Test VI.....	78
61. Ranking of Schools in each of the Seven Points and on the Whole Test.....	79
62. Results in Decimal Fractions in Grade VI, Test VII.....	80
63. Ranking of Schools in each of the Seven Points and on the Whole Test.....	81
64. Summary of Rankings of all Tests in Arithmetic in Grade VI.....	82
65. Results in Addition in Grade VII, Test I.....	83
66. Ranking of Schools in each of the Seven Points and on the Whole Test.....	84
67. Results in Multiplication in Grade VII, Test II.	85

LIST OF TABLES (Cont.)

	Page
68. Ranking of Schools in each of the Seven Points and on the Whole Test.....	86
69. Results in Division in Grade VII, Test III...	86
70. Ranking of Schools in each of the Seven Points and on the Whole Test.....	87
71. Results in Subtraction in Grade VII, Test IV.	88
72. Ranking of Schools in each of the Seven Points and on the Whole Test.....	89
73. Results in Addition and Subtraction of Fractions In Grade VII, Test V.....	89
74. Ranking of Schools in each of the Seven Points and on the Whole Test.....	90
75. Results in Multiplication and Division of Fractions in Grade VII, Test VI.....	91
76. Ranking of Schools on each of the Seven Points and on the Whole Test.....	92
77. Results in the Placing of the Decimal Point in the Answer, when a Decimal Point Occurs in the Divisor, or Dividend, or both.....	92
78. Ranking of Schools in each of the Seven Points and on the Whole Test.....	93
79. Summary of the Rankings of All Tests in Arithmetic in Grade VII.....	94
80. Results in Addition in Grade VIII, Test I....	95
81. Ranking of All Schools in each of the Seven Points and on the Whole Test.....	96
82. Results in Multiplication in Grade VIII, Test II.....	96
83. Ranking of All Schools in each of the Seven Points and on the Whole Test.....	97

LIST OF TABLES (Cont.)

	Page
84. Results in Division in Grade VIII, Test III...	98
85. Ranking of Schools in each of the Seven Points and on the Whole Test.....	99
86. Results in Subtraction in Grade VIII, Test IV.....	99
87. Ranking of Schools in each of the Seven Points and on the Whole Test.....	100
88. Results in Subtraction and Addition of Fractions in Grade VIII, Test V.....	101
89. Ranking of Schools in each of the Seven Points and on the Whole Test.....	102
90. Results in Multiplication and Division of Fractions in Grade VIII, Test VI.....	102
91. Ranking of Schools in each of the Seven Points and on the Whole Test.....	103
92. Results in the Placing of the Decimal Point in the Answer When a Decimal Point Occurs in the Divisor, Dividend, or both, Test VII.	104
93. Ranking of Schools in each of the Seven Points and on the Whole Test.....	105
94. Summary of the Rankings on all Tests in Grade VIII.....	106
95. Median Scores for Grade III.....	107
96. Median Scores for Grade IV.....	108
97. Median Scores for Grade V.....	108
98. Median Scores for Grade VI.....	108
99. Median Scores for Grades VII and VIII.....	109

10. Scores in Silent Reading Made by Children
Sixth Grade Pupils in the Township School....

LIST OF FIGURES

	Page
1. Sample Figure for Recording Scores in Silent Reading.....	10
2. Scores in Silent Reading Made by Twenty-nine Fourth Grade Pupils in the Shadeland School..	13
3. Scores in Silent Reading Made by Twenty-two Fourth Grade Pupils in the Cumberland School.	14
4. Scores in Silent Reading made by Fifteen Fourth Grade Pupils in the Westland School.....	15
5. Scores in Silent Reading Made by Twenty-one Fourth Grade Pupils in the Township School...	16
6. Scores in Silent Reading Made by Ten Fourth Grade Pupils in the Lowell School.....	17
7. Scores in Silent Reading Made by Thirty-two Fifth Grade Pupils in the Shadeland School...	20
8. Scores in Silent Reading Made by Thirty-two Fifth Grade Pupils in the Cumberland School..	21
9. Scores in Silent Reading Made by Nineteen Fifth Grade Pupils in the Westland School.....	22
10. Scores in Silent Reading Made by Twenty-three Fifth Grade Pupils in the Township School....	23
11. Scores in Silent Reading Made by Twenty-four Fifth Grade Pupils in the Lowell School.....	24
12. Scores in Silent Reading Made by Thirty-one Sixth Grade Pupils in the Shadeland School...	26
13. Scores in Silent Reading Made by Twenty-six Sixth Grade Pupils in the Cumberland School..	27
14. Scores in Silent Reading Made by Sixteen Sixth Grade Pupils in the Westland School.....	28
15. Scores in Silent Reading Made by Thirteen Sixth Grade Pupils in the Township School....	29

LIST OF FIGURES (Cont.)

	Page
16. Scores in Silent Reading Made by Sixteen Sixth Grade Pupils in the Lowell School.....	30
17. Results Obtained in the New York Survey Test, Language Usage in Grade V, Part I.....	112
18. Results Obtained in the New York Survey Test, Language Usage in Grade V, Part II.....	113
19. Results Obtained in the New York Survey Test, Language Usage in Grade VI, Part I.....	115
20. Results Obtained in the New York Survey Test, Language Usage in Grade VI, Part II.....	117
21. Results Obtained in the New York Survey Test, Language Usage in Grade VII, Part I.....	119
22. Results Obtained in the New York Survey Test, Language Usage in Grade VII, Part II.....	120
23. Results Obtained in the New York Survey Test, Language Usage in Grade VIII, Part I.....	121
24. Results Obtained in the New York Survey Test, Language Usage in Grade VIII, Part II.....	122

similar results. Certain charges have been made against the teaching staff, which if true, would mean the lowering of the standards of the pupils in their regular studies.

Problem. The question as to the justice or injustice of such charges presented a problem for solution, important in one of two ways:-1. If the charges are true, then a change in the teaching staff should be secured. 2. If the charges are untrue, then the patrons should know of the falsity of such charges and turn their attention to supporting the school as before, and as

CHAPTER I

INTRODUCTION

The Westland public school is a small consolidated school having twelve grades organized on the six-six plan. It is the only school in Blue River Township, Hancock County, Indiana, and is strictly a rural school, as there is no town in the township.

The patrons of the school maintain a high degree of interest in their school and loyally support all school activities. But recently some changes seem to have taken place in this attitude toward the school. The patrons have become dissatisfied with school affairs. Accusations have been made stating that the pupils are not receiving proper instruction and that they are not achieving as much from their school work as pupils in similar schools. Certain charges have been made against the teaching staff, which if true, would mean the lowering of the achievements of the pupils in their regular studies.

Problem. The question as to the justice or injustice of such charges presented a problem for solution, important in one of two ways:-1. If the charges are true, then a change in the teaching staff should be secured. 2. If the charges are untrue, then the patrons should know of the falsity of such charges and turn their attention to supporting the school as before, and no

longer criticise the school unjustly.

Method. The method used in attempting the solution of the problem was to give achievement tests in the Westland school and compare the results of these tests with similar results of the same tests given in other schools. Such results, to be comparable, should be obtained from schools very similar in character to the Westland school. The schools of Warren Township, Marion County, Indiana, were chosen. These schools, namely, Cumberland, Lowell, Shadeland, and Township, are rural schools, the teaching staffs were very similar to that at Westland, and the number of pupils per grade was close to that at Westland.

The schools of Warren Township had already used achievement tests in Silent Reading and in Arithmetic. The results had been tabulated, thus making them readily available. The tests used were Stone's Series of Narrative-Reading Tests and Monroe's Standardized General Survey Arithmetic, Scales I and II. *

Similar results were not available at Westland, so the same tests were given in the same subjects at Westland and the results tabulated.

Since achievement tests in two basic subjects, Silent Reading and Arithmetic, had been used in the Warren Township schools, comparisons could be made in

*Copies of these tests are included in Appendix (A)

used exclusively in scoring this test.

these two subjects. It was then concluded to make a further study of the achievements at Westland by testing the pupils there in Language Usage and comparing the results of these tests with the norms established by some standardized test in language usage. The New York English Survey Test-Language Usage was chosen for this purpose. A Nation-wide Survey had been made by New York in 1925 and more than one hundred thousand cases were tabulated. After these tests had been given at Westland the results were compared with the norms established by this survey.

Description of tests used. The Language Usage tests are in two parts. Part I consists of a list of thirty incorrect sentences. Each sentence is followed by a group of words, some of which may be used to make the sentence correct. The pupil is instructed to underline all words he thinks are necessary to make the sentence correct or complete. The correct answers for each sentence vary from one to three, and two columns of results are kept, one for correct answers and one for incorrect answers. The score in Part I is found by subtracting the number wrong from the number right. In case the former predominates, the score is zero. The correct answers are found in an accompanying key to be used exclusively in scoring this test.

Part II consists of a series of eighteen sentences in which one word in each sentence has been omitted. No information is given the pupils as to the correct word so he must select the word from his own vocabulary which he thinks will most adequately complete the sentence. In each case the possible answers will vary from one to three and no credit is given for an answer not found in the accompanying key. The pupil's score is the number of correct answers made. Percentiles were then found for each part on a scale of 25, 50, and 75, and comparisons made with the same percentiles established by the Nation-Wide Survey. Since the survey was Nation-Wide and contained over one hundred thousand cases, the percentiles of the survey may readily be considered as reliable standards for comparison.

In Silent Reading, Stone's Series of Narrative-Reading Tests were used. These tests are for grades three to eight inclusive. Since Warren Township had not used them in the third grade, comparisons were possible only in grades four to eight inclusive. These tests indicate a pupil's rate of speed in silent reading and also his ability to comprehend what he has read. In each grade, a preparatory test, the reading of some well constructed narrative is given to acquaint

the pupil with the work.

To ascertain the pupil's rate of speed in reading silently, an assistant displays a series of numbered cards, turning one every five seconds until ample time has been given to complete the story. Each card carries a different number, which will indicate the number of words the pupil is reading per minute and the pupil is instructed to look up, as soon as he has finished reading the story, and see what number is being shown. Then he is to write this number on his answer sheet. The number indicates the number of words the pupil has read per minute.

A series of questions is asked to test the pupil's power of comprehension. Each question is followed by a list of five lettered answers. The pupil then selects the one which, in his judgement, most nearly gives the correct answer to the question and then places the letter of his selected answer on the answer sheet, numbered to correspond to the number of question. The number of correct answers is his comprehension score.

This series of tests was selected because they were inexpensive, easily given, easily scored, strictly objective, and also, as stated above, they had been used in the Warren Township schools. Moreover, they have been standardized and the norms established are relia-

ble, making it possible to extend the comparison beyond the limits of the Warren Township schools.

Monroe's Standardized General Survey Arithmetic Scales were chosen for two reasons. The tests are so constructed that a teacher can readily see wherein lie the weak points of her class and where her instruction is failing to help her class attain the standard required. In the second place, these tests were used in the Warren Township schools and the results were readily available for comparison.

quietly in his daily vocation, and this fact has become an open challenge to the schoolmen of today. Consequently, such prominent educators as J. A. Brown, A. A. Courtis, A. G. Latham, R. W. Gray, D. Starch, and others, have been making intensive and extensive studies of the problem of reading ability and have found that there are many factors to be considered. Outstanding among these are (1.) the character of the reading matter in its varied forms, as prose, poetry, narrative, dialect, letters, and (2.) the fact that attention to both character and form helps to develop an appreciation of the thought expressed; its clearness, beauty and strength.

Since not few people read orally, the problem of reading ability can be limited to a study of silent

CHAPTER II

SILENT READING

One of three fundamental studies to be pursued in all schools is reading, but until very recent years, little study had been made of the subject as such. Tests given to thousands of young men called to the colors during the World War revealed the fact that the average American does not obtain sufficient reading ability from his school activities to function adequately in his daily vocation, and this fact has become an open challenge to the schoolmen of today. Consequently, such prominent educators as J. A. Brown, S. A. Curtis, A. A. Kellum, W. S. Gray, D. Starch, and others, have been making intensive and extensive studies of the problem of reading ability and have found that there are many factors to be considered. Outstanding among these are (1.) the character of the reading matter in its varied forms, as prose, poetry, narrative, dialect, letters, and (2) the fact that attention to both character and form helps to develop an appreciation of the thought expressed, its clearness, beauty and strength.

Since so few people read orally, the problem of reading ability can be limited to a study of silent

reading. Its importance is very aptly stated in the following quotation from a bulletin issued by the Public School Publishing Company, Bloomington, Illinois:

"Within late years, teachers and educators everywhere have become increasingly conscious that they are confronting a silent reading problem. This problem is of extreme importance because it is fundamental and prerequisite to the ability to study from the printed page. Silent reading is also of the first magnitude in training for citizenship because those who are poor in silent reading do not read much. To them reading is arduous labor. They are not well posted on the problems of the days, are unable to become intelligent voters, and are quite likely to become only mediocre citizens. Not only is the pupil's late life affected, but as long as he remains in school, his studying is constantly difficult because he cannot read quickly and well. As he continues through the grades, his handicap increases until he finally becomes discouraged and leaves school without making many of the subjects that would be of benefit to him."

Recognizing the importance of reading in public schools, some of our leading educators are trying to find remedies for the defects in reading ability. Many failures in other subjects may be credited to inability to read and interpret the assignments. Analyses of pupils' abilities and disabilities in reading have been and are being made in order to discover what action should be taken to overcome these defects. It is not the purpose, however, of this dissertation to discuss the various factors entering into the problem, but rather to study rate and comprehension of silent reading for the purpose of comprehending the efficiency of the schools concerned in this study. The a-

9.
chievements in silent reading in the Westland school were compared with similar results in the schools of Warren Township and with the standards accompanying the tests.

Stone's * Silent Reading Tests were used and the results in grades four, five, and six were arranged in squares as shown in Figure I. The large squares are divided into thirty-six smaller squares and the thirty-six squares are grouped into nine squares of four each. A number is placed in the center of each of the nine squares showing how many cases fell in each area. Figure I. and its explanation endeavors to illustrate its use.



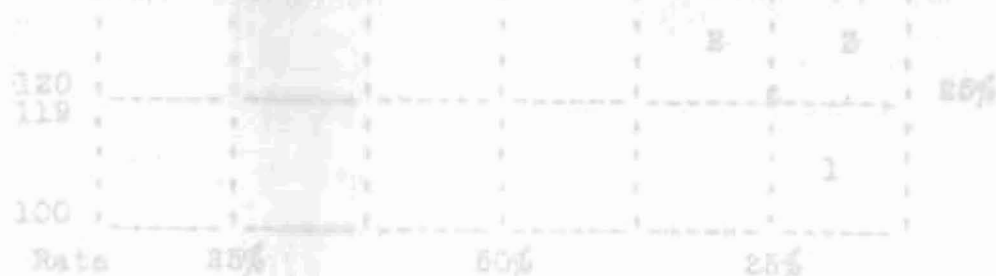
* See appendix A Page 131

By the use of this figure, the scores for both rate and comprehension can be shown together for the whole class thus enabling the reader to see at a glance the condition of the class and wherein lie its difficulties as to rate of reading and degree of comprehension. To illustrate the use of the figure, suppose a fourth grade pupils scores 4 in comprehension and 240 in rate. An x is placed in the square to the right of the 3 line and above the 240 line. Since 4 is a poor score for comprehension and 240 is too rapid a rate for a fourth grade pupil, this location will indicate that the scores of the rapid readers who are poor in comprehension will fall in the upper left part of the figure.

Again, if a pupil makes a score of 12 in comprehension and 120 rate, his mark will fall to the right of 11 line and lower part of square opposite 120. This indicates that the scores of the slow readers, who comprehend well, will fall in the lower right part of the figure. The scores of the pupils who are especially good in both rate and comprehension will fall in the upper right part of the figure, while the scores of those who are very poor in both rate and comprehension will fall in the lower left part, and all other between these extremes.

Figure Professor C. R. Stone in his tests has further divided this large square into three parts for rate and three parts for comprehension as shown in figure I, Page 10. He says that 25% of the class should be classed as inferior, 50% as average, and 25% as superior. This, in small classes, can only be approximated. With this explanation of the method of tabulation used in each square, a comparison of the results of the different schools may now be made. The scores of the seventh and eighth grades will be treated in another manner, to be explained on page 32.

First, the scores of Fourth Grade pupil will be compared. This comparison is shown on page 32.



* Figures falling on crossed lines indicate the number of pupils' scores falling in the four small squares surrounding the number.

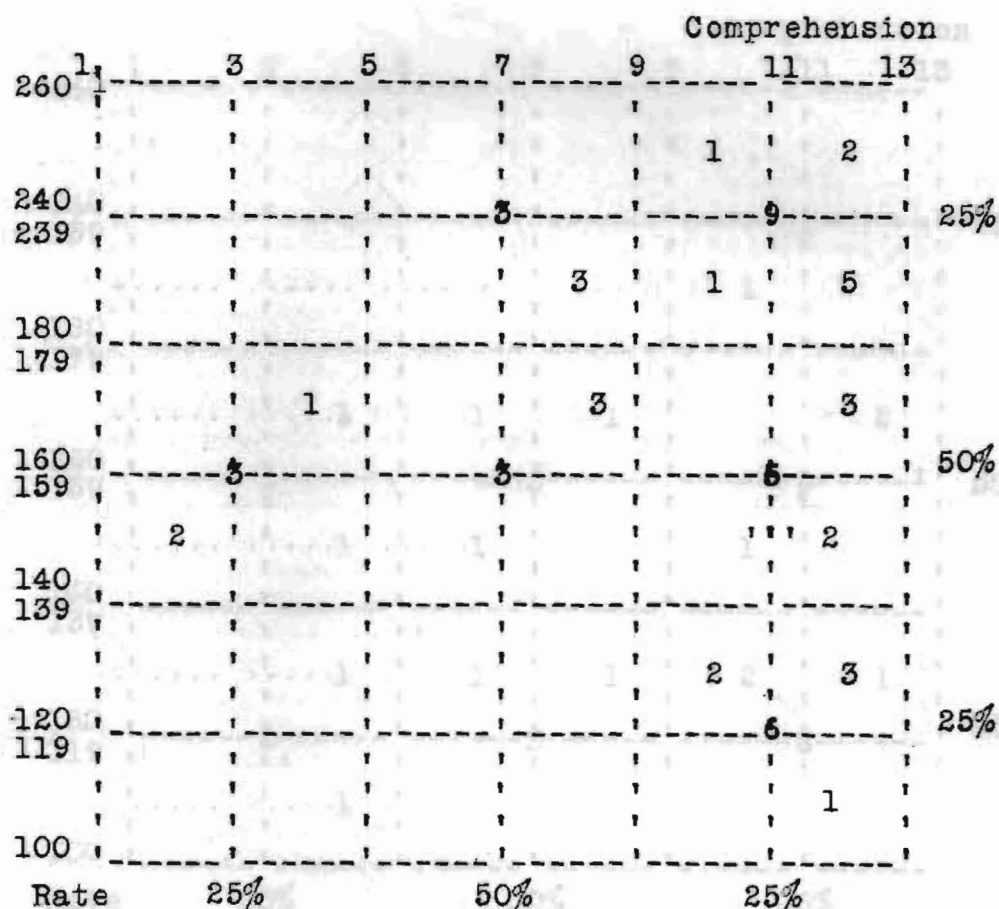
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First, the scores of Fourth Grade pupil will be compared. This comparison is shown on page 32.



* Figures falling on excess lines indicate the number of pupils' scores falling in the four small squares surrounding the number.

Figure II. Scores in Silent Reading made by
Twenty-nine Fourth Grade Pupils
in the Shadeland School. *



* Figures falling on crossed lines indicate the number of pupils' scores falling in the four small squares surrounding the number.

Figure III. Scores in Silent Reading made by
Twenty-two Fourth Grade Pupils in
the Cumberland School.

		Comprehension							
		1	3	5	7	9	11	13	
260	240	1							
239	180								
179	160								
159	140		1	1	1			5	
139	120		2		3		6		50%
119	100		1	1		1			
			1	1	1	2	1		
			2		3		6		25%
			1		1	1		2	
Rate		25%			50%		25%		

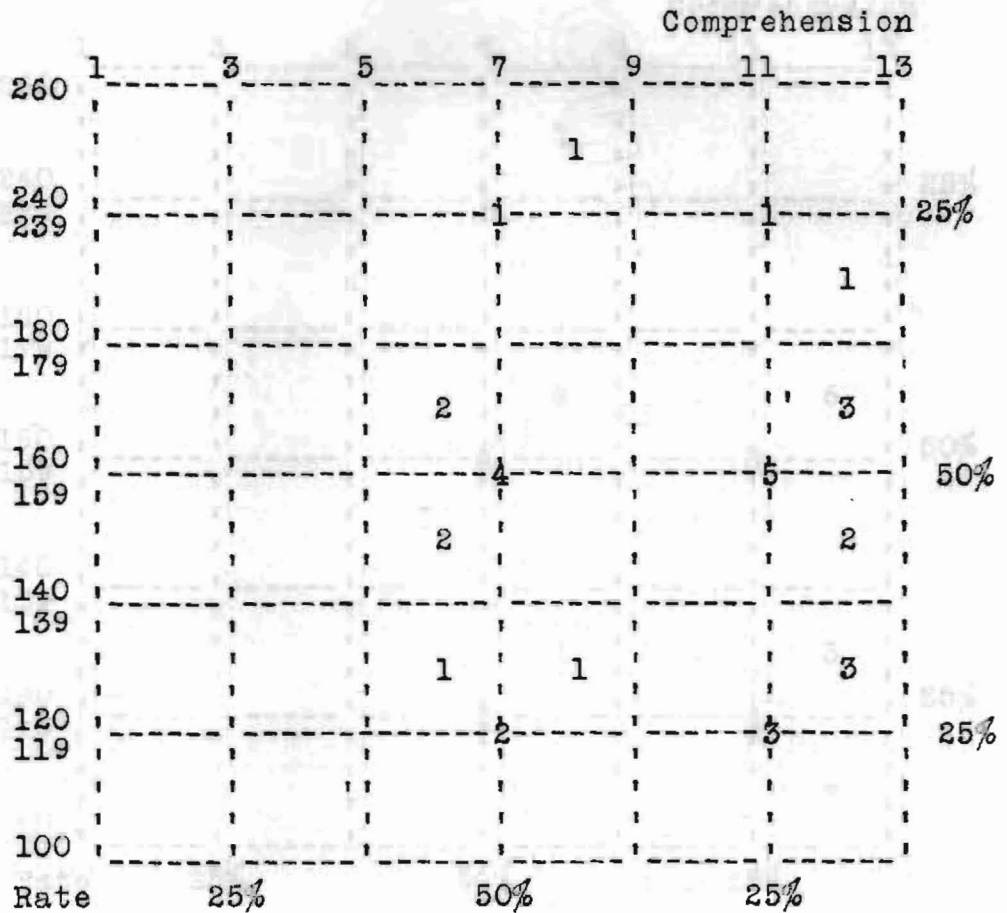


Figure V. Scores in Silent Reading made by
Twenty-one Fourth Grade Pupils in
the Township School.

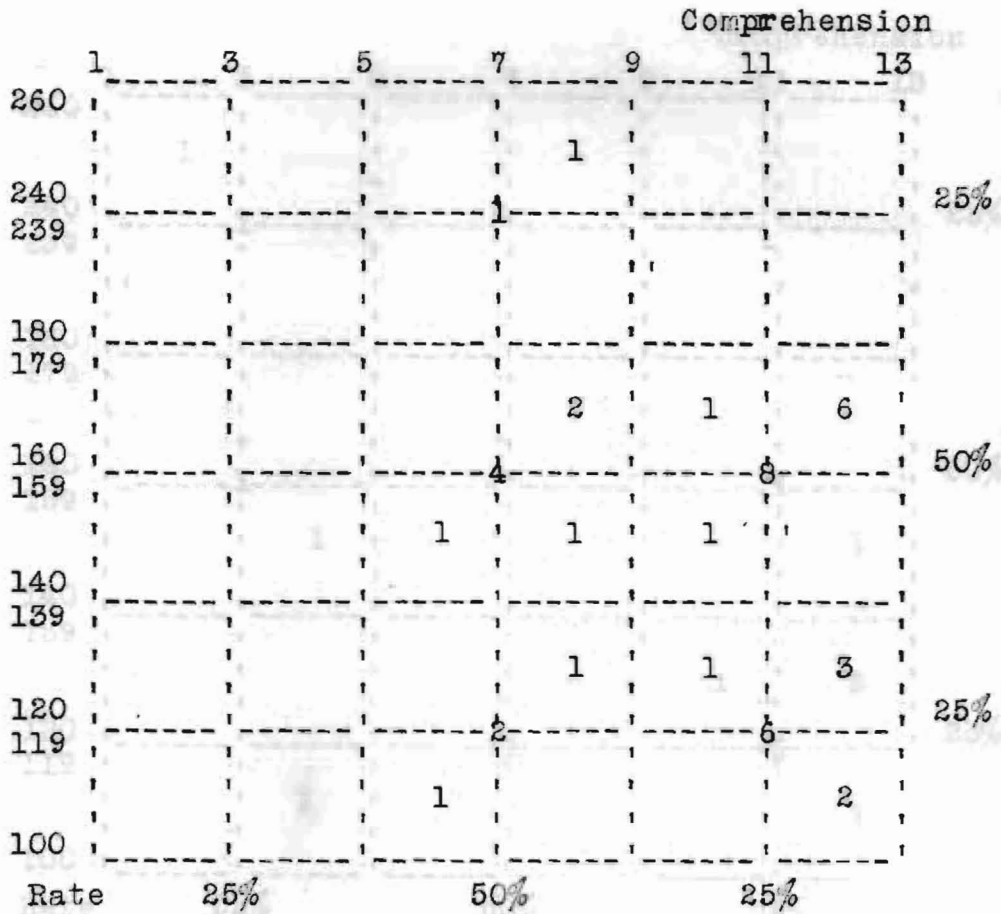


Figure VI. Scores in Silent Reading made by
Ten Fourth Grade Pupils in the
Lowell School.

		Comprehension						
	1	3	5	7	9	11	13	
260								
	1							
240								25%
239		1						
180								
179								
160								50%
159		1				1		
			1				1	
140								
139								
						1	3	
120								25%
119				2		5		
					2		1	
100								
Rate		25%		50%		25%		

18.
A further comparison of the achievement of these schools is shown in a tabulation of the medians in the tables following the figures in each grade. The schools below

Table I

Comparison of Median Scores in Rate in Grade IV.

Stone's Standard median rate	14
Shadeland	13
Cumberland	13
Township	13
Westland	13
Lowell	12

Table II

Comparison of Median Scores in
Comprehension in Grade IV.

Stone's Standard median comprehension	170
Shadeland	180
Township	160
Westland	154
Cumberland	130
Lowell	130

The Stone Standards are for pupils who are doing the last half of the year's work in each grade. The tests at Westland were given near the close of the school year so that a close comparison is possible by using these scores. Table I shows that Westland compares very fa-

vorably with the other schools but is a little below Stone's Standard. Table II shows all the schools below the standard except Shadeland, Westland being quite low.

In like manner the results for the fifth grade are shown on pages 20 to 25 inclusively.

Figure VII. Scores in Silent Reading made by Thirty-two Fifth Grade Pupils in the Shadeland School.

		Comprehension								
		1	3	5	7	9	11	13		
260			1							
240							1			
239					1		2		25%	
					1					
180										
179										
								2		
160										
159			1				9		50%	
			1				2	5		
140										
139									25%	
			1		1	5		7		
120										
119			1		1		17			
							3	2		
100										
Rate		25%			50%		25%			

Figure VIII. Scores in Silent Reading made by
Thirty-two Fifth Grade Pupils in
the Cumberland School.

		Comprehension								
		1	3	5	7	9	11	13		
260							1			
240					1		4		25%	
239										
				1			3			
180										
179		1		1		2		2		
160										
159			5		6		4		50%	
			3			4		2		
140										
139										
			2			2		4		
120										
119			5		3		4		25%	
		2		1		1				
100										
Rate		25%			50%		25%			

Figure IX. Scores in Silent Reading made by
Nineteen Fifth Grade Pupils in the
Westland School.

		Comprehension								
		1	3	5	7	9	11	13		
260										
		1		2			2			
240			3		2		2		25%	
239										
				1	1			1		
180										
179										
							2			
160			3		1		6		50%	
159				3	1		2	2		
140										
139					1			1		
120					1		1		25%	
119										
100										
Rate		25%			50%		25%			

Figure X. Scores in Silent Reading made by
Twenty-three Fifth Grade Pupils in
the Township School.

		Comprehension							
		1	3	5	7	9	11	13	
260							2	2	
240							6		25%
239							1	1	
180									
179								4	
160					1		7		50%
159						1	1	2	
140									
139									
				2			3	2	
120					3		6		25%
119									
				1			1		
100									
Rate		25%			50%		25%		

Figure XI. Scores in Silent Reading made by Twenty-four Fifth Grade Pupils in Lowell School.

Stane's Standard-----		Comprehension														
		1	3	5	7	9	11	13								
260																
240																
239																
180																
179																
		1		1						1						
160																
159																
140																
139																
				3			1						5			
120																
119																
		1			2		1		1				4			
100																
Rate		25%				50%				25%						

The preceding figures indicate the standings of the fifth grade of the various schools compared in Silent Reading. A comparison of median scores of this grade in the various schools with the median scores of the standardized tests will be found in Tables III and IV.

Table III

Median Scores in Rate in Grade V

Stone's Standard-----	195
Westland-----	210
Cumberland-----	180
Township-----	180
Shadeland-----	152
Lowell-----	133

Table IV

Median Scores in Comprehension in Grade V

Stone's Standard-----	14.5
Shadeland-----	15.6
Township-----	14.7
Westland-----	12.5
Lowell-----	12.5
Cumberland-----	10.0

Table III shows Westland leading the other schools in rate and even in advance of Stone's Standard, while Table Four shows Westland below Stone's Standard. From an examination of these two tables it is seen that Westland's fifth grade has stressed rate at the expense of comprehension and ranks higher than only one of the other schools.

In like manner the results for the sixth grade are shown on pages 26 and 31 inclusively.

Figure XII. Scores in Silent Reading made by
Thirty-one Sixth Grade Pupils in
The Shadeland School.

		Comprehension								
		1	3	5	7	9	11	13		
260										
240										
239					1					25%
						1				
180										
179										
			1				1	5		
160		2			5		3			50%
159			1		3	2	2	5		
140										
139			1		2	1	2	3		
120		1			3		6			25%
119										
							1			
100										
Rate		25%			50%		25%			

Figure XIII. Scores in Silent Reading made by
Twenty Sixth Grade Pupils in the
Cumberland School.

		Comprehension						
		1	3	5	7	9	11	13
260								
		1					1	
240								
239					1		1	
			2			1		
180								
179								
			2	2	1		1	
160					5		2	
159								
			1			2	1	
140								
139							2	
120			1		2		2	
119								
			1		2			
100								
Rate		25%			50%		25%	

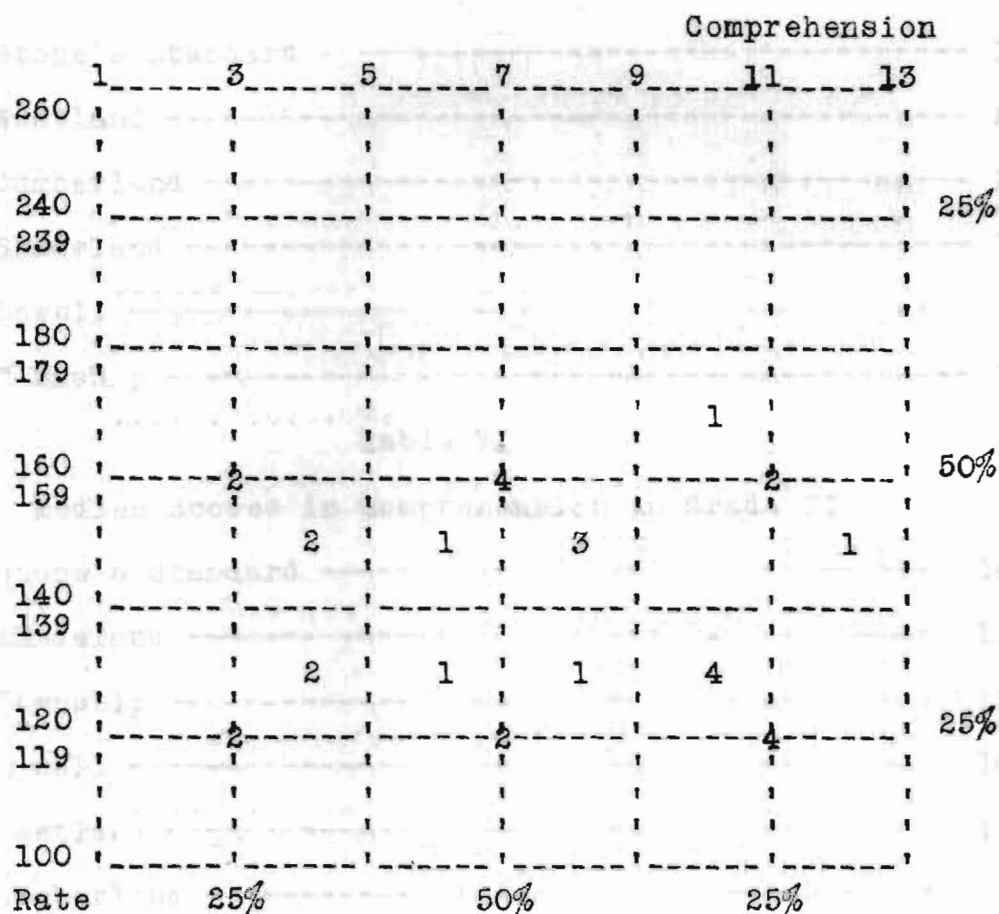
Figure XIV. Scores in Silent Reading Made by Sixteen Sixth Grade Pupils in the Westland School.

		Comprehension							
		1	3	5	7	9	11	13	
260									
240			2		2	1	1	1	
239			2		3		2		25%
240									
180									
179									
180						1		1	
160					3		5		50%
159									
160						2	2	2	50%
140									
139									
140									
120							1		25%
119									
120							1		25%
100									
Rate		25%			50%		25%		

Figure XV. Scores in Silent Reading made by Thirteen Sixth Grade Pupils in the Township School.

		Comprehension								
		1	3	5	7	9	11	13		
260	:	:	:	:	:	:	:	:	25%	
240	:	:	:	:	:	:	:	:		
239	:	:	:	:	:	:	:	:		
180	:	:	:	:	:	:	:	:	50%	
179	:	:	:	:	:	:	:	:		
160	:	:	:	:	:	:	:	:		
159	:	:	:	:	:	:	:	:	25%	
140	:	:	:	:	:	:	:	:		
139	:	:	:	:	:	:	:	:		
120	:	:	:	:	:	:	:	:	25%	
119	:	:	:	:	:	:	:	:		
100	:	:	:	:	:	:	:	:		
Rate		25%			50%			25%		

Figure XVI. Scores in Silent Reading made by
Sixteen Sixth Grade Pupils in
the Lowell School.



31.

Number of pupils tested: Shadeland 41; Cumberland 20;
Westland 16; Township 13; Lowell 16.

Table V

Median Scores in Rate in Grade VI

Stone's Standard -----	195
Westland -----	240
Cumberland -----	210
Shadeland -----	167
Lowell -----	160
Township -----	126

Table VI

Median Scores in Comprehension in Grade VI

Stone's Standard -----	14.
Shadeland -----	13.5
Township -----	12.5
Lowell -----	10.5
Westland -----	10.5
Cumberland -----	9.2

Table V shows Westland to be entirely too fast in rate, while Table VI shows that Westland pupils fail to understand well what is read. Speed is gained at the expense of comprehension. They rank next to last in comprehension, considerably below Stone's median score for this grade.

Grades VII and VIII

Grades VII and VIII of Warren Township are consolidated in the Junior High school. Each grade at Warren Township has been divided into three classes on basis of intelligence scores and designated as 7a, 7b, 7c, 8a, 8b, and 8c. The results of the tests given to these classes and to the corresponding classes at Westland are shown in the following tables.

Table VII

Median Scores in Rate of Silent Reading
in Grade VII of each School in
Comparison with Stone's Standard

Stone's Standard -----	218
Westland -----	230
Township 7c -----	222
Township 7a -----	195
Township 7b -----	141

Table VIII

Median Scores in Comprehension in Silent Reading in Grade VII of each School in Comparison with Stone's Standard.

Stone's Standard -----	11
Township 7c -----	13
Township 7a -----	9
Township 7b -----	9
Westland -----	9

The same criticism must be offered of Grade VII of Westland that was made of Grade VI. Speed is attained at the expense of comprehension.

Table IX

Median Scores in Rate of Silent Reading in Grade VIII of each School in Comparison with Stone's Standard.

Stone's Standard -----	240
Township 8c -----	273
Township 8a -----	225
Westland -----	223
Township 8b -----	208

Table X

Median Scores in Comprehension in Silent Reading in Grade VIII of each School in Comparison with Stone's Standard.

Stone's Standard -----	13.5
Township 8c -----	14
Township 8a -----	13
Township 8b -----	9
Westland -----	8.5

Table IX shows that Westland is below Stone's Standard, but ranks third among the other classes compared, while Table X shows that Westland is far below Stone's Standard in comprehension, and is also below each of the other classes compared.

From a study of the above figures and tables, it is evident that the work done at Westland in Silent Reading is not up to the standards of the other schools in this comparison. In rate of reading Westland ranks high enough but is weak in comprehension and more attention should be given to this work at Westland.

In the following chapter a study of achievements in Arithmetic is given.

CHAPTER III

ARITHMETIC

In the investigation of the work done in Arithmetic at Westland and the other schools mentioned in the preceding chapter, Monroe's * General Survey Arithmetic Scales were used, Scale One for grades III, IV, and V, and Scale Two for grades VI, VII, and VIII.

Scale One consists of eight tests as follows: 1, Addition; 2, Subtraction; 3, Multiplication; 4, Division. The second four are a repetition of the first four, but the problems are more difficult. Tests seven and eight were too far advanced for the classes examined, since they had not yet had this work; since however, the material for tests seven and eight was printed with the other tests, pupils were allowed to try them but the results were not tabulated.

Scale Two consists of seven tests, the first four dealing with the four fundamental operations, the fifth with addition and subtraction of simple fractions, the sixth with multiplication and division of fractions, and the seventh with decimal fractions. The problem involved in the seventh test is the placing of

* See appendix B, page 137.

the decimal point in the answer to a problem in Division when either divisor, or dividend, or both, contain a decimal point. ^{36.}

Since Arithmetic is considered by all school patrons as vitally important, an especially intensive study of the achievements of the schools mentioned above has been made in this subject. Seven points of comparison were used, as follows:

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving correctly one hundred per cent of the problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The number of problems solved correctly.

These points of comparison furnish a good view of the accuracy and efficiency of each school's work in Arithmetic. The results are tabulated according to these seven points in each test for each grade, except in grade III, and the ranking given following each table. The results of the tests in grade III are tabulated in a different manner. The heading of each table is self-explanatory.

Table XI

Problems Attempted by Grade III, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	38	35	20	31	16
Tests					
1	8.2	19.2	11.5	13.3	8.0
2	5.2	10.8	6.0	8.1	8.0
3	4.6	5.5	5.5	10.1	6.5
4	4.0	4.1	3.7	0.0	5.5
5	4.8	4.7	6.3	5.6	5.5
6	4.3	1.0	6.6	5.2	5.5
Rank	1	5	3	4	2

Table XII

Problems Solved Correctly by Grade III, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	38	35	20	31	16
Tests					
1	8.2	18.8	10.5	13.3	8.0
2	4.2	8.2	2.5	7.9	8.0
3	3.6	3.2	2.5	7.9	6.5
4	3.1	2.2	2.6	3.0	5.0
5	4.0	4.1	4.2	5.1	5.0
6	2.3	1.0	2.7	3.7	6.5
Rank	5	3	4	1	2

Table XIII

38.

Pupils in Grade III Solving All Problems Attempted, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	38	35	20	31	16
Tests					
1	26	18	8	17	15
2	11	4	3	14	2
3	8	6	1	9	8
4	9	5	0	0	10
5	14	14	3	9	7
6	0	2	0	0	3
Rank	1	2	4	2	3

Table XIV

Pupils in Grade III Solving No Problems, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	38	35	20	31	16
Tests					
1	1	2	0	0	0
2	5	5	6	0	0
3	8	3	1	2	0
4	8	12	13	21	1
5	2	5	3	0	0
6	15	25	1	14	5
Rank	4	5	2	3	1

Table XV

Tabulation of Ranks in Grade III

	Shadeland	Cumberland	Lowell	Township	Westland
Tables					
XI	1	5	3	4	2
XII	5	3	4	1	2
XIII	1	2	4	2	3
XIV	4	5	2	3	1
Rank	3	5	4	2	1

From the above tables, it is evident that the III grade at Westland is doing better work in Arithmetic than the other schools compared with it. In fact, the median score of the Westland's III grade (13.7) is 3.7 points above the standard established by Monroe, which is 10.0.

Results of the tests of the remaining Grades IV, V, VI, VII, and VIII, are tabulated according to the following points of comparison, each point keeping the same position in each table:

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

By measuring each operation in each test for each Grade by the above points of comparison, a very good inspection is made of each school's work in Arithmetic. The ranking of each school is given after each test.

Table XVI

41.

RESULTS IN ADDITION IN GRADE IV, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	15.0	18.0	16.5	18.7	11.0
2	14.0	18.0	16.5	18.7	13.0
3	23.0	17.0	11.0	19.0	14.0
4	59.0	77.3	84.6	100.0	81.7
5	87.7	98.0	96.7	100.0	99.0
6	9.4	17.2	16.9	18.7	12.8
7	8.0	16.0	15.9	18.7	12.7

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XVII

Ranking of Schools in Each of the Seven Points
and on the test as a whole.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	4	2	3	1	5
2	4	2	3	1	5
3	1	3	5	2	4
4	5	4	2	1	3
5	5	3	4	1	2
6	5	2	3	1	4
7	5	2	3	1	4
Total	29	18	23	8	27
Rank	5	2	3	1	4

Table XVIII

Results in Subtraction in Grade IV, Test II

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	10	9.2	7.8	12.7	12
2	9.8	9.0	7.5	12.7	12
3	11.0	5.0	8.0	13.0	13
4	30.0	22.7	61.5	58.5	81.7
5	87.7	77.3	88.1	96.5	97.1
6	9.3	11.4	7.7	12.2	7.6
7	8.2	8.8	6.9	11.7	7.1

Points of Comparison

43.

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XIX

Ranking of schools in each of the seven points and of the whole test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points of Comparison					
1	3	4	5	1	2
2	3	4	5	1	2
3	2	4	3	1	1
4	4	5	3	2	1
5	4	5	3	2	1
6	3	2	4	1	5
7	3	2	5	1	4
Total	22	26	28	9	16
Rank	3	4	5	1	2

Table XX

Results in Multiplication in Grade IV, Test III

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	12.0	7.5	11	12.5	12
2	11.0	5.2	9.7	12.2	12
3	13.0	3.0	7.0	7.0	13
4	33.0	15.0	54.0	37.0	81.7
5	90.0	77.3	90.0	91.1	95.7
6	11.4	8.4	9.8	12.4	11.7
7	10.1	6.1	9.0	11.4	11.2

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Points Table XXI

Ranking of Schools in Each of the Seven Points
and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	5	4	1	3
2	3	5	4	1	2
3	1	3	2	2	1
4	3	5	2	4	1
5	3	4	3	2	1
6	3	4	3	1	2
7	3	5	4	1	2
Total	18	31	22	12	12
Rank	2	4	3	1	1

Table XXII

Results in Division in Grade IV, Test IV

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	10.6	6.0	8.3	14.1	8.5
2	10.0	3.7	8.3	13.6	8.0
3	17.0	4.0	6.0	14.0	13.0
4	43.0	18.0	46.0	75.0	81.7
5	81.3	57.1	94.9	96.6	95.2
6	4.0	6.0	9.4	12.4	7.6
7	3.5	3.7	9.0	12.0	7.1

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XXIII

Ranking of Schools in Each of the Seven points and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	5	4	1	3
2	2	5	3	1	4
3	1	5	4	2	3
4	4	5	3	2	1
5	4	5	3	1	2
6	5	4	2	1	3
7	5	4	2	1	3
Total	23	33	21	9	19
Rank	4	5	3	1	2

Table XXIV

Results in Addition in Grade IV, Test V

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	7.8	7.1	6.5	8.2	5.0
2	6.8	6.0	5.4	7.9	6.0
3	18.0	9.0	4.0	9.0	8.0
4	46.0	41.0	31.0	47.0	50.0
5	77.5	85.5	81.8	88.0	91.6
6	3.6	7.0	5.9	8.1	6.5
7	2.8	6.0	6.1	7.3	6.1

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XXV

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	3	4	1	5
2	2	3	4	1	3
3	1	2	4	2	3
4	3	4	5	2	1
5	5	3	4	2	1
6	5	2	4	1	3
7	4	3	2	1	2
Total	22	20	27	10	18
Rank	4	3	5	1	2

Table XXVI

Results in Addition In Grade IV, Test VI

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	7.4	15.0	7.0	11.0	14.0
2	6.8	7.0	5.0	10.2	14.5
3	6.0	1.0	5.0	10.0	8.0
4	16.0	5.0	3.8	53.0	50.0
5	57.5	47.5	63.7	87.5	88.1
6	5.0	15.0	7.9	10.2	12.1
7	3.0	7.4	5.0	8.0	10.6

Points of Comparison

1. The median number of problems attempted
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XXVII

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	4	1	5	3	2
2	4	3	5	2	1
3	3	5	4	1	2
4	3	4	5	1	2
5	4	5	3	2	1
6	5	1	4	3	2
7	5	3	4	2	1
Total	28	22	30	14	11
Rank	4	3	5	2	1

Table XXVIII

Results in Multiplication in Grade IV, Test VII

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	4.1	2.0	3.0	4.0	3.6
2	2.2	0.0	0.0	2.5	2.0
3	5.0	5.0	3.0	4.0	1.0
4	13.0	23.0	54.0	21.0	6.2
5	87.8	16.3	30.9	73.1	44.0
6	1.8	2.5	7.0	3.5	3.6
7	1.6	0.5	2.2	1.6	1.6

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XXIX

Ranking of Schools in Each of the Seven points
and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	1	5	4	2	3
2	2	4	4	1	3
3	1	1	3	2	4
4	4	2	1	3	5
5	1	5	4	2	3
6	5	4	1	3	2
7	2	3	1	2	2
Total	16	24	18	15	22
Rank	2	5	3	1	4

Table XXX

Results in Division in Grade IV, Test VIII

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	39	22	13	19	16
Points of Comparison					
1	5.7	1.0	3.5	5.0	3.0
2	2.5	0.0	0.0	3.0	2.0
3	2.0	1.0	1.0	1.0	0.0
4	0.5	0.5	7.0	5.0	0.0
5	78.7	0.0	15.0	60.0	46.0
6	13.2	1.0	5.0	3.5	3.9
7	2.5	0.0	0.5	1.6	1.8

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XXXI

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	1	5	3	2	4
2	2	4	4	1	3
3	1	2	2	2	3
4	3	3	1	2	4
5	1	5	4	2	3
6	4	5	1	3	2
7	1	5	4	3	2
Total	13	29	19	15	21
Rank	1	5	3	2	4

Results in Table XXXIII Grade V

Summary of Ranking of all Tests in Arithmetic in Grade IV.

	Shadeland	Cumberland	Lowell	Township	Westland
Tests					
1	5	2	3	1	4
2	3	4	5	1	2
3	2	4	3	1	1
4	4	5	1	1	2
5	4	3	5	1	2
6	4	3	5	2	1
7	2	5	3	1	4
8	1	5	3	2	4
Total	25	31	28	10	18
Rank	3	5	4	1	2

This summary of the work done in Arithmetic in Grade IV shows that Westland ranks second and made a very good showing with the schools compared.

* The fifth grade at Lowell was divided into two sections, each of which will be treated as a separate unit and designated here and in subsequent tables as Lowell 1 and Lowell 2.

Results in Arithmetic in Grade V

Table XXXIII

Results in Addition in Grade V, Test I

	Shade land	Cumber land	Lowell* 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	19.8	19.0	21.8	18.0	20.6	16.5
2	18.8	18.8	21.8	18.0	20.6	16.0
3	29.0	26.0	14.0	13.0	19.0	21.0
4	96.0	81.0	93.0	100.0	79.0	95.5
5	99.6	98.5	99.3	100.0	99.0	99.1
6	18.4	17.0	20.7	18.0	20.5	18.7
7	18.4	16.7	20.1	18.0	20.3	15.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.

* The fifth Grade at Lowell was divided into two sections, each of which will be treated as a separate school and designated here and in subsequent tables as Lowell 1 and Lowell 2.

- 6. The average number of problems attempted.
- 7. The average of problems solved correctly.

Shade land Cumber land Lowell Township West land Table XXXIV

Ranking of the Schools in Each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points	16.0	10.0	22.0	11.7	24.8	11.3
1	3	4	1	5	2	6
2	3	3	1	4	2	5
3	1	2	5	6	4	3
4	2	5	4	1	6	3
5	2	4	3	1	6	5
6	4	6	1	5	2	3
7	3	5	2	4	1	6
Total	18	29	17	26	23	31
Rank	2	5	1	4	3	6

- 4. The per cent of pupils making one hundred per cent in accuracy.
- 5. The per cent of accuracy in all problems attempted.
- 6. The average number of problems attempted.
- 7. The average of problems solved correctly.

Table XXXV

Results in Subtraction in Grade V, Test II

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22

Points of Comparison

1	16.4	10.0	15.0	12.0	15.2	13.5
2	16.0	10.0	15.0	11.7	14.8	11.5
3	23.0	18.0	13.0	9.0	15.0	15.0
4	76.0	56.0	87.0	69.0	62.0	68.1
5	99.6	94.6	98.2	94.2	96.3	97.6
6	14.5	12.0	15.1	12.4	14.8	13.1
7	14.1	14.1	14.9	11.6	14.2	12.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XXXVI

Ranking of the Schools in each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points						
1	1	6	3	5	2	4
2	1	6	2	4	3	5
3	1	2	4	5	3	3
4	2	6	1	3	5	4
5	1	5	2	6	4	3
6	3	6	1	5	2	4
7	3	3	1	5	2	4
Total	12	34	14	33	21	27
Rank	1	6	2	5	3	4

Table XXXVII

Rankings of Schools in each of the Seven Points
and Results in Multiplication in Grade V, Test III

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	14.5	8.0	18.6	11.3	14.0	14.5
2	12.7	6.5	18.2	10.7	13.0	14.0
3	12.0	18.0	9.0	6.0	11.0	11.0
4	40.0	56.0	60.0	46.0	21.0	50.0
5	90.9	80.7	96.1	91.4	87.6	92.6
6	13.0	8.5	17.5	12.5	14.1	13.7
7	12.0	7.0	16.3	11.4	12.3	12.2
Total	275	228	10	31	24	18

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XXXVIII

Rankings of Schools in each of the Seven Points
and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points						
1	2	5	1	4	3	2
2	4	6	1	5	3	2
3	2	1	4	5	3	3
4	5	2	1	4	6	3
5	4	6	1	3	5	2
6	4	6	1	5	2	3
7	4	6	1	5	2	3
Total	25	32	10	31	24	18
Rank	4	6	1	5	3	2

1. The median number of problems attempted.

2. The median number of problems solved correctly.

3. The number of pupils solving one hundred per cent of all problems attempted.

4. The per cent of pupils solving one hundred per cent in accuracy.

5. The per cent of answers correct in all problems attempted.

6. The average number of problems attempted.

7. The average of problems solved correctly.

Table XXXIX

Results in Division in Grade V, Test IV

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	12.8	8.5	19.0	11.3	14.0	11.5
2	12.0	7.0	18.3	10.7	13.0	10.0
3	15.0	8.0	11.0	6.0	11.0	16.0
4	50.0	25.0	73.0	46.0	46.0	72.7
5	92.3	84.0	97.2	91.4	91.2	97.0
6	13.0	10.2	17.7	12.5	14.2	10.7
7	12.0	9.0	16.3	11.4	13.0	10.5

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XL

Ranking of the Schools in Each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	39	9	30	20	24
Points						
1	3	6	1	5	2	4
2	3	6	1	4	2	5
3	2	4	3	5	3	1
4	3	5	1	4	4	2
5	3	6	1	4	5	2
6	3	6	1	4	2	5
7	3	6	1	4	2	5
Total	20	39	9	30	20	24
Rank	2	5	1	4	2	3

The median number of problems solved correctly.
 The number of pupils solving one hundred per cent
 of all problems attempted.
 The per cent of pupils making one hundred per
 cent in accuracy.
 The per cent of pupils in all problems at-
 tempted.
 The average number of problems attempted.
 The average of problems solved correctly.

Table XLI

Ranking of the Pupils in each of the Seven Points
and of the Results in Addition in Grade V, Test V

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	8.6	7.4	7.7	7.8	9.0	4.0
2	8.0	6.8	6.8	7.4	8.2	4.0
3	14.0	27.0	27.0	2.0	10.0	15.0
4	46.0	84.0	84.0	13.0	42.0	68.1
5	91.3	90.0	90.0	95.1	88.8	92.0
6	8.4	7.0	7.0	6.9	9.0	4.5
7	7.7	6.0	6.0	6.6	8.0	4.1

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XLII

Ranking of the Schools in each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points						
1	2	5	4	3	1	6
2	2	4	4	3	1	5
3	3	1	1	5	4	2
4	3	1	1	5	4	2
5	3	4	4	1	5	2
6	2	3	3	4	1	5
7	2	4	4	3	1	5
Total	17	22	21	24	17	27
Rank	1	3	2	4	1	5

2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XLIII

Results in Subtraction in Grade V, Test VI

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	11.8	11.0	7.3	10.5	9.0	9.0
2	10.9	10.3	7.0	7.8	8.2	10.0
3	17.0	11.0	6.0	11.0	10.0	10.0
4	56.0	73.0	46.0	34.0	42.0	45.4
5	93.0	97.0	87.1	84.0	88.8	84.0
6	11.5	10.8	7.7	8.6	9.0	8.8
7	10.6	10.5	6.8	7.1	8.0	7.4

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XLIV

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Tests	30	32	15	13	24	22
Points of Comparison						
1	1	2	5	3	4	4
2	1	2	6	5	4	3
3	1	2	4	2	3	3
4	2	1	3	6	5	4
5	2	1	4	5	3	5
6	1	2	6	5	3	4
7	1	2	6	5	3	4
Total	9	12	34	31	25	27
Rank	1	2	6	5	3	4

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Results in Multiplication in Grade V, Test VII

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	4.1	2.1	4.5	2.9	5.0	5.0
2	3.1	1.0	2.7	1.8	2.7	3.1
3	10.0	9.0	5.0	5.0	11.0	3.0
4	33.0	28.0	33.0	38.0	46.0	15.0
5	73.0	50.0	81.0	62.5	71.9	64.0
6	3.7	2.0	3.9	2.9	4.5	4.3
7	2.7	1.0	3.1	1.8	3.2	2.7
Total	16	33	13	10	11	11
Points of Comparison						

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

— Table XLVI

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points						
1	3	5	2	4	1	1
2	1	4	2	3	2	1
3	2	3	4	4	1	5
4	3	4	3	2	1	5
5	2	6	1	5	3	4
6	4	6	3	5	1	2
7	3	5	2	4	1	3
Total	18	33	17	27	10	21
Rank	3	6	2	5	1	4

—Table XLVII

Results in Division in Grade V, Test VIII

	Shade land	Cumber land	Lowell 1	Lowell 2	Township Township	West land
Pupils	30	32	15	13	24	22
Points of Comparison						
1	5.3	1.0	6.2	4.3	6.6	2.0
2	4.2	0.0	5.3	0.5	4.2	7.0
3	4.0	0.0	2.0	2.0	4.0	1.0
4	13.0	0.0	13.0	15.0	17.0	4.5
5	69.0	10.0	73.0	50.0	54.0	46.1
6	5.1	1.0	5.7	3.6	7.3	3.0
7	3.5	2.0	4.1	2.1	4.0	1.3

Total 15

57

Points of Comparison

53

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table XLVIII

Ranking of Schools in Each of the Seven Points and of the Whole Test.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Points						
1	3	6	2	4	1	5
2	3	5	2	4	3	1
3	1	4	2	2	1	3
4	3	5	3	2	1	4
5	2	6	1	4	3	5
6	3	6	2	4	1	5
7	3	5	1	4	2	6
Total	18	37	13	24	12	29
Rank	8	6	2	4	1	5

From this summary it will be seen that West-land ranks high among the schools compared.

Results in Table XLIX in Grade VI

Summary of Rankings of all Tests in Arithmetic in Grade V.

	Shade land	Cumber land	Lowell 1	Lowell 2	Township	West land
Tests	32	39	17	36	17	33
1	2	5	1	4	3	6
2	1	6	2	5	3	4
3	4	6	1	5	3	2
4	2	5	1	4	2	3
5	1	3	2	4	1	5
6	1	2	6	5	3	4
7	3	6	2	5	1	4
8	3	6	2	4	1	5
Total	17	39	17	36	17	33
Rank	1	4	1	3	1	2

From this summary it will be seen that West-land ranks high among the schools compared.

Results in Arithmetic in Grade VI

Ranking of Schools Table L of the Seven Points
and of the Whole Test.

Results in Addition in Grade VI, Test I

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points				7.0	6.0
1	7.0	5.2	7.4	7.0	6.0
2	4.8	3.6	4.3	4.5	3.5
3	2.0	3.0	2.0	2.0	0.0
4	6.0	15.0	10.0	14.0	0.0
5	66.0	51.0	62.8	62.3	59.8
6	6.5	5.5	6.7	6.3	6.0
7	4.3	2.8	4.0	3.2	3.6

Rank Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average of problems solved correctly.

Table LI

Ranking of Schools in Each of the Seven Points
and of the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	4	1	2	3
2	1	4	3	2	5
3	2	1	2	2	3
4	4	1	3	2	5
5	1	5	2	3	4
6	2	5	1	3	4
7	1	5	2	4	3
Total	13	25	14	18	27
Rank	2	4	1	3	5

Table LII

Results in Multiplication in Grade VI, Test II

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	17	21	16
Points of Comparison					
1	6.3	4.4	5.6	7.2	6.0
2	4.6	1.0	3.0	5.7	3.5
3	5.0	3.0	1.0	1.0	0.0
4	16.0	15.0	6.0	7.0	0.0
5	65.0	40.0	50.0	64.9	47.3
6	5.7	4.6	6.0	7.0	6.0
7	3.7	1.8	3.0	4.0	2.8

Points of Comparison

1. The median number of problems attempted. 111
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted. 47.3
7. The average number of problems solved correctly.

Table LIII

Ranking of Schools on Each of the Seven Points and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	4	4	1	3
2	2	5	4	1	3
3	1	2	3	3	4
4	1	2	4	3	5
5	1	5	3	2	4
6	3	4	2	1	2
7	2	5	3	1	4
Total	12	28	23	12	25
Rank	1	4	2	1	3

Table LIV

Results in Division in Grade VI, Test III

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points of Comparison					
1	6.3	4.4	5.6	7.2	6.0
2	4.6	1.0	3.0	5.7	3.5
3	5.0	3.0	1.0	1.0	0.0
4	16.0	15.0	6.0	7.0	0.0
5	65.0	40.0	50.0	64.9	47.3
6	5.7	4.6	6.0	7.0	6.0
7	3.7	1.8	3.0	4.0	2.8

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LV

Ranking of Schools on Each of the Seven
Points and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	5	4	1	3
2	2	5	4	1	3
3	1	2	3	3	4
4	1	2	4	3	5
5	1	5	3	2	4
6	3	4	2	1	2
7	2	5	3	1	4
Total	12	28	23	12	25
Rank	1	4	2	1	3

Table LVI

Results in Subtraction in Grade VI, Test IV.

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points of Comparison					
1	7.0	4.5	7.2	8.6	6.0
2	6.5	4.0	6.2	8.5	5.0
3	17.0	0.0	8.0	10.0	5.0
4	53.0	0.0	42.0	71.0	31.2
5	90.0	83.1	90.6	96.4	83.5
6	6.8	4.1	7.1	8.0	6.0
7	6.2	3.9	6.4	7.7	5.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LVII

Ranking of Schools in Each of the Seven Points and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	3	5	2	1	4
2	2	5	3	1	4
3	1	5	3	2	4
4	2	5	3	1	4
5	3	5	2	1	4
6	3	5	2	1	4
7	3	5	2	1	4
Total	17	35	17	8	28
Rank	2	4	2	1	3

Table LVIII

Results in Addition and Subtraction of Fractions
in Grade VI, Test V.

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points of Comparison					
1	4.1	10.0	6.5	6.0	11.5
2	11.8	0.0	1.8	2.0	0.0
3	4.0	8.0	0.0	0.0	1.0
4	12.0	40.0	0.0	0.0	6.2
5	22.0	0.6	19.4	20.0	8.7
6	4.6	9.5	8.0	6.4	9.9
7	1.4	1.0	15.5	2.0	0.8

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LIX

Ranking of Schools in Each of the Seven
Points and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	5	2	3	4	1
2	2	3	2	1	3
3	2	1	4	4	3
4	2	1	4	4	3
5	2	5	3	1	4
6	5	2	3	4	1
7	3	4	1	2	5
Total	21	18	20	20	20
Rank	3	2	1	1	1

Table LX

Results in Multiplication and Division of Fractions
in Grade VI, Test VI.

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points of Comparison					
1	6.8	8.0	6.6	6.2	6.5
2	4.3	0.8	3.3	4.0	3.0
3	3.0	1.0	0.0	2.0	1.0
4	10.0	5.0	0.0	14.0	6.2
5	60.0	24.0	36.6	63.0	51.9
6	6.1	7.2	7.3	6.6	6.5
7	3.6	1.8	2.7	3.4	3.3

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXI

Ranking of Schools in Each of the Seven
Points and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	2	1	3	5	4
2	1	5	3	2	4
3	1	3	4	2	3
4	2	4	5	1	3
5	2	5	4	1	3
6	5	2	1	3	4
7	1	5	4	2	3
Total	14	25	24	16	24
Rank	1	4	3	2	3

Table LXIII

Results in Decimal Fractions in Grade VI, Test VII
Comparison and on the whole test.

	Shadeland	Cumberland	Lowell	Township	Westland
Pupils	32	20	19	21	16
Points of Comparison					
1	7.0	16.0	13.4	4.5	11.5
2	5.0	2.0	6.0	2.6	9.0
3	2.0	0.0	1.0	2.0	1.0
4	16.0	0.0	5.0	14.0	6.2
5	60.0	19.0	48.0	61.0	48.7
6	77.6	15.2	13.0	6.0	12.4
7	4.5	2.9	6.2	3.6	6.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXIII

Ranking of Schools on Each of the Points of
Comparison and on the Whole Test.

	Shadeland	Cumberland	Lowell	Township	Westland
Points					
1	4	1	2	5	3
2	3	5	2	4	1
3	1	3	2	1	2
4	1	5	4	2	3
5	2	5	4	1	3
6	4	1	2	5	3
7	3	5	1	4	2
Total	18	25	17	22	17
Rank	2	4	1	3	1

Grades Table LXIV of Warren Township

Summary of Rankings of All Tests in Township Junior
Arithmetic in Grade VI.
High School and each grade divided into three classes.

	Shadeland	Cumberland	Lowell	Township	Westland
Tests on each class is treated separately.					
1	2	4	1	3	5
2	1	4	2	1	3
3	1	4	2	1	3
4	2	4	2	1	3
5	3	2	1	1	1
6	1	4	3	2	3
7	2	4	1	3	1
Total	12	26	12	12	19
Rank	1	3	1	1	2

The conclusion, relative to work done in Arithmetic in Grade VI at Westland, is that Westland is doing average work and should not be condemned in its accomplishment.

Grades VII and VIII of Warren Township have been consolidated into the Warren Township Junior High School and each grade divided into three classes, designated as 7a-7b-7c and 8a-8b-8c, and in this investigation each class is treated separately.

Results in Arithmetic in Grade VII

Table LXV

Results in Addition in Grade VII, Test I.

	7a	7b	7c	Westland
Pupils	28	31	27	21
Points of Comparison				
1	8.0	7.6	5.1	6.0
2	5.2	4.0	4.0	4.0
3	11.0	4.0	5.0	0.0
4	39.0	12.0	19.0	0.0
5	92.0	55.0	64.0	62.8
6	7.5	7.7	5.4	5.7
7	5.7	4.5	3.5	3.6

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.

5. The per cent of accuracy in all problems attempted.

6. The average number of problems attempted.

7. The average number of problems solved correctly.

Table LXVI

Ranking of Schools in Each of the Seven Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	1	2	4	3
2	1	2	2	2
3	1	3	2	4
4	1	3	2	4
5	1	4	2	3
6	2	1	4	3
7	1	2	4	3
Total	8	17	20	22
Rank	1	2	3	4

Table LXVII

Results in Multiplication in Grade VII, Test II

	7a	7b	7c	Westland
Pupils	26	31	27	21
Points of Comparison				
1	7.1	6.1	4.2	5.5
2	4.4	3.1	1.6	4.0
3	3.0	1.0	4.0	1.0
4	10.0	3.0	15.0	4.7
5	66.0	54.0	47.0	58.0
6	8.1	6.8	4.6	5.2
7	5.4	3.7	2.2	3.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXVIII

Ranking of Schools in Each of the Seven
Points and on the Whole Test.

	7a	7b	7c	Westland
Points				
1	1	2	4	3
2	1	3	4	2
3	2	3	1	3
4	2	4	1	3
5	1	3	4	2
6	1	2	4	3
7	1	2	4	3
Total	9	19	22	21
Rank	1	2	4	3

Table LXIX

Results in Division in Grade VII, Test III.

	7a	7b	7c	Westland
Pupils	26	31	27	21
Points of Comparison				
1	4.5	4.2	3.4	4.0
2	4.0	2.4	3.0	2.5
3	5.0	6.0	7.0	5.0
4	17.0	19.0	27.0	23.8
5	74.0	63.0	65.0	69.0
6	5.4	4.8	3.8	4.2
7	4.0	3.1	2.3	3.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXX

Ranking of Schools in Each of the Seven
Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	1	2	4	3
2	1	4	2	3
3	3	2	1	3
4	4	3	1	2
5	1	4	3	2
6	1	2	4	3
7	1	2	4	3
Total	12	19	19	19
Rank	1	2	2	2

Table LXXI

Results in Subtraction in Grade VII, Test IV.

	7a	7b	7c	Westland
Pupils	26	31	27	21
Points of Comparison				
1	6.0	5.0	4.0	9.0
2	1.1	0.1	1.0	0.0
3	7.0	7.0	5.0	0.0
4	25.0	22.0	19.0	0.0
5	34.0	27.0	16.0	5.3
6	7.6	6.2	4.8	9.0
7	2.5	1.7	0.7	0.4

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXII

Ranking of Schools in Each of the Seven
Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	2	3	4	1
2	1	2	1	3
3	1	1	2	3
4	1	2	3	4
5	1	2	3	4
6	2	3	4	1
7	1	2	3	4
Total	9	15	20	20
Rank	1	2	3	3

Table LXXIII

Results in Addition and Subtraction of Fractions
in Grade VII, Test V.

	7a	7b	7c	Westland
Pupils	26	31	27	21
Points of Comparison				
1	7.1	6.0	5.3	6.0
2	6.1	2.1	1.5	5.0
3	6.0	2.0	3.0	1.0
4	2.1	6.0	11.0	4.7
5	65.0	50.0	41.0	60.9
6	7.8	6.3	5.6	6.3
7	5.1	3.1	2.3	3.8

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXIV

Ranking of Schools in Each of the Seven Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	1	2	3	2
2	1	3	4	2
3	1	3	2	4
4	4	2	1	3
5	1	3	4	2
6	1	2	3	2
7	1	3	4	2
Total	10	18	21	17
Rank	1	3	4	2

Table LXXV

Results in Multiplication and Division of Fractions
in Grade VII, Test VI.

	7a	7b	7c	Westland
Pupils	26	31	27	21
Points of Comparison				
1	6.0	5.0	4.0	9.0
2	1.1	0.1	1.0	0.0
3	7.0	7.0	5.0	0.0
4	25.0	22.0	19.0	0.0
5	34.0	27.0	16.0	5.3
6	7.6	6.2	4.8	9.0
7	2.5	1.7	0.7	0.4

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXVI
 Ranking of Schools in Each of the Seven
 Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	2	3	4	1
2	1	3	2	4
3	1	1	2	3
4	1	2	3	4
5	1	2	3	4
6	2	3	4	1
7	1	2	3	4
Total	9	16	21	21
Rank	1	2	3	3

Table LXXVII

Results in the Placing of the Decimal Point in the Answer, when a Decimal Point Occurs in the Divisor, or Dividend or Both, Test VII.

	7a	7b	7c	Westland
Pupils	23	31	27	21
Points of Comparison				
1	18.0	11.0	7.0	8.0
2	9.1	1.1	0.5	0.0
3	9.2	1.1	0.5	0.0
4	10.0	6.0	7.0	4.7
5	64.0	40.0	35.0	25.1
6	17.5	10.8	7.1	7.5
7	10.1	4.3	2.5	1.9

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXVIII

Ranking of Schools in Each of the Seven Points and in the Whole Test.

	7a	7b	7c	Westland
Points				
1	1	2	4	1
2	1	2	3	4
3	1	2	3	4
4	1	3	2	4
5	1	2	3	4
6	1	2	4	3
7	1	2	3	4
Total	7	15	22	24
Rank	1	2	3	4

Table LXXIX
Summary of the Rankings of Tests in
Arithmetic in Grade VII.

	7a	7b	7c	Westland
Tests				
1	1	2	3	4
2	1	2	4	3
3	1	2	2	2
4	1	2	2	3
5	1	3	4	2
6	1	2	3	3
7	1	2	3	4
Total	7	15	21	19
Rank	1	2	4	3

In Grade VII, Westland makes a poor showing, being able to obtain only third place.

Results in Arithmetic in Grade VIII

Table LXXX

Results in Addition in Grade VIII, Test I

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	8.5	8.1	8.1	6.0
2	6.2	5.2	5.3	4.0
3	5.0	6.0	1.0	1.0
4	17.0	20.0	4.2	5.2
5	68.0	71.0	65.0	71.0
6	9.4	9.3	8.8	6.7
7	6.5	6.0	6.4	4.8

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXXI

Ranking of Schools in Each of the Seven
Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	1	2	2	3
2	1	3	2	4
3	2	1	3	3
4	2	1	4	3
5	2	1	3	2
6	1	2	3	4
7	1	3	2	4
Total	10	13	19	23
Rank	1	2	3	4

Table LXXXII

Results in Multiplication in Grade VIII, Test II

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	8.3	8.0	5.5	7.0
2	5.4	4.2	3.1	4.0
3	2.0	4.0	1.0	1.0
4	6.0	13.0	4.0	5.0
5	67.0	66.0	68.0	57.4
6	8.9	8.4	6.2	7.0
7	5.7	5.4	3.6	4.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXXIII

Ranking of the Schools in Each of the Seven Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	1	2	4	3
2	1	2	4	3
3	2	1	3	3
4	2	1	4	3
5	2	3	1	4
6	1	2	4	3
7	1	2	4	3
Total	10	13	24	25
Rank	1	2	3	4

Table LXXXIV

Results in Division in Grade VIII, Test III

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	5.9	5.5	4.0	5.0
2	3.7	3.8	2.2	3.0
3	4.0	7.0	3.0	2.0
4	13.0	24.0	13.0	10.4
5	71.0	74.0	61.0	71.8
6	6.3	5.9	4.6	5.4
7	4.7	4.4	3.0	4.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXXV

Ranking of Schools in Each of the Seven
Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	1	2	4	3
2	2	1	4	3
3	2	1	3	4
4	2	1	2	3
5	3	1	4	2
6	1	2	4	3
7	1	2	4	3
Total	12	10	25	21
Rank	2	1	4	3

Table LXXXVI

Results in Subtraction in Grade VIII, Test IV

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	10.6	7.6	6.1	8.0
2	8.1	6.1	5.2	7.0
3	15.0	16.0	8.0	6.0
4	51.0	55.0	34.0	31.2
5	84.0	88.0	82.0	90.4
6	10.9	8.1	6.8	7.6
7	9.3	7.4	5.7	6.9

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXXVII

Ranking of Schools in Each of the Seven
Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	1	3	4	2
2	2	1	3	4
3	2	1	3	4
4	2	1	3	4
5	3	2	4	1
6	1	2	4	3
7	1	2	4	3
Total	12	12	25	21
Rank	1	1	3	2

Table LXXXVIII

Results in Subtraction and Addition of Fractions
in Grade VIII, Test V.

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	6.2	4.3	5.6	6.0
2	4.0	1.2	0.6	0.0
3	13.0	9.0	0.0	0.0
4	42.0	31.0	0.0	9.0
5	41.0	36.0	12.0	25.0
6	7.7	6.1	7.0	6.0
7	3.3	2.1	3.2	2.0

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table LXXXIX

Ranking of Schools in Each of the Seven

1. Points and in the Whole Test.

	8a	8b	8c	Westland
Points	The number of pupils solving one hundred per cent of all problems attempted.			
1	1	4	3	2
2	1	2	3	4
3	1	2	3	3
4	1	2	3	3
5	1	2	4	3
6	1	3	2	4
7	1	3	2	4
Total	7	18	20	23
Rank	1	2	3	4

Table X0

Results in Multiplication and Division of Fractions in Grade VIII, Test VI.

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	8.1	9.0	5.2	7.0
2	6.0	7.0	3.0	4.0
3	4.0	7.0	1.0	3.0
4	13.0	24.0	4.0	15.7
5	64.0	68.0	53.0	51.1
6	12.9	8.4	6.0	6.0
7	5.6	5.9	3.2	3.5

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The per cent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XCI

Ranking of Schools in Each of the Seven Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	2	1	4	3
2	2	1	4	3
3	2	1	4	3
4	3	1	4	2
5	2	1	3	4
6	1	2	3	3
7	2	1	4	3
Total	14	8	26	21
Rank	2	1	4	3

Table XCII

Results in the Placing of the Decimal Point in the Answer when a Decimal Point Occurs in the Divisor, Dividend, or Both, Test VII.

	8a	8b	8c	Westland
Pupils	23	29	29	19
Points of Comparison				
1	9.1	7.0	6.0	7.0
2	3.0	3.0	1.0	4.0
3	2.0	6.0	2.0	1.0
4	6.0	20.0	8.0	5.2
5	44.0	57.0	29.0	49.3
6	10.1	7.4	7.6	7.4
7	4.5	4.2	2.4	3.6

Points of Comparison

1. The median number of problems attempted.
2. The median number of problems solved correctly.
3. The number of pupils solving one hundred per cent of all problems attempted.
4. The per cent of pupils making one hundred per cent in accuracy.
5. The percent of accuracy in all problems attempted.
6. The average number of problems attempted.
7. The average number of problems solved correctly.

Table XCIII

Ranking of Each School in Each of the Seven
Points and in the Whole Test.

	8a	8b	8c	Westland
Points				
1	1	2	3	2
2	2	2	3	1
3	2	1	2	3
4	3	1	2	4
5	3	1	4	2
6	1	3	2	3
7	1	2	4	3
Total	13	12	20	18
Rank	2	1	4	3

The above summary shows that Westland is doing fairly creditable work at the eighth grade in correlative with the schools studied.

Table XCIV

Summary of the Rankings on all Tests in Grade VIII
median scores, by grades of the five schools studied.

Tests	8a	8b	8c	Westland
1	1	2	3	4
2	1	2	3	4
3	2	1	4	3
4	1	1	3	2
5	1	2	3	4
6	2	1	4	3
7	2	1	4	3
Total	10	10	24	23
Rank	1	1	3	2

The above summary shows that Westland is doing fairly creditable work in the eighth grade in comparison with the schools studied.

To make a further study of the achievements in Arithmetic in the Westland school, a comparison of median scores, by grades of the five schools studied, has been made with the median scores of the various tests as furnished by the author of the tests. These median scores are for the grades, as a whole, and not for each test in a grade and since these tests are standardized, the median scores furnish a good basis of comparison.

Median Scores for Grade V

A Comparison of Median Scores in Arithmetic

Table XCV

Median Scores for Grade III

Monroe's Standard	10.0
Westland	13.7
Township	13.5
Cumberland	12.5
Shadeland	8.2
Lowell	8.0

The Median Table XCVI Grades VII and VIII

Warren To Median Scores for Grade IV were not available.

Monroe's Standard -----	21
Township -----	41.5
Westland -----	32.6
Shadeland -----	28
Lowell -----	24
Cumberland -----	20

Table XCVII

Median Scores for Grade V

Monroe's Standard -----	35
Township -----	45
Shadeland -----	41.7
Lowell -----	35
Westland -----	30.5
Cumberland -----	25.6

Table XCVIII

Median Scores for Grade VI

Monroe's Standard -----	44
Township -----	60
Shadeland -----	58
Westland -----	53
Cumberland -----	40.5
Lowell -----	34

The Median Scores for Grades VII and VIII of Warren Township Junior High School were not available, so no comparison can be made with the same grades at Westland.

However, the Median Scores for these grades at Westland were compared with Monroe's Standard scores as shown in table XCIX.

Table XCIX

Median Scores for Grades VII and VIII

	Seven	Eight
Monroe's Standard -----	53	61
Westland -----	49	61

A study of these Median Scores shows that Westland, when compared with other schools, obtains first place in Grade III, second in Grade IV, fourth in Grade V, and third in Grade VI. In a grouping of these four grades Westland ranks second.

A comparison of Westland's Median Scores with Monroe's Standards shows that the Westland Medians are above these standards in Grades III, IV, and VI, falls below in Grades V and VII, and is the same in VIII. From above comparisons it is evident Westland is above criticism in achievements in Arithmetic.

CHAPTER IV

LANGUAGE USAGE

In chapters II and III the reader has been shown a comparison of the achievements in Silent Reading and Arithmetic at Westland with similar achievements in the four schools of Warren Township in the same subjects.

In this chapter we shall see a comparison of the Westland school in Language Usage, with the percentile scores as furnished by the New York Survey Test, which was conducted in 1925.

A copy of this English Survey Test-Language Usage used in this Nation Survey may be found in appendix C on page 138. This survey was made throughout the United States during the months of October and November, 1925, when median and percentile grades were established. The test in language usage is arranged in two parts. The first part deals with the pupil's efforts to underline the proper word, in a list of four words, which will correct a given sentence. The second part consists in supplying from his own vocabulary, the correct word to complete a given sentence.

There are thirty sentences in Part I, and eighteen in Part II. The former was given to 101,088 pupils,

and the latter to 99,207 pupils. These large numbers make the medians and percentiles, derived from them, reliable standards of comparison.

This Language Usage test had not been given in the Warren Township schools and as the school year was so nearly over, time was not available to give it to them. Therefore no comparisons have been made between them and the Westland school. The only comparisons possible are between the median and percentile scores made at Westland and those established by the Nation Wide Survey.

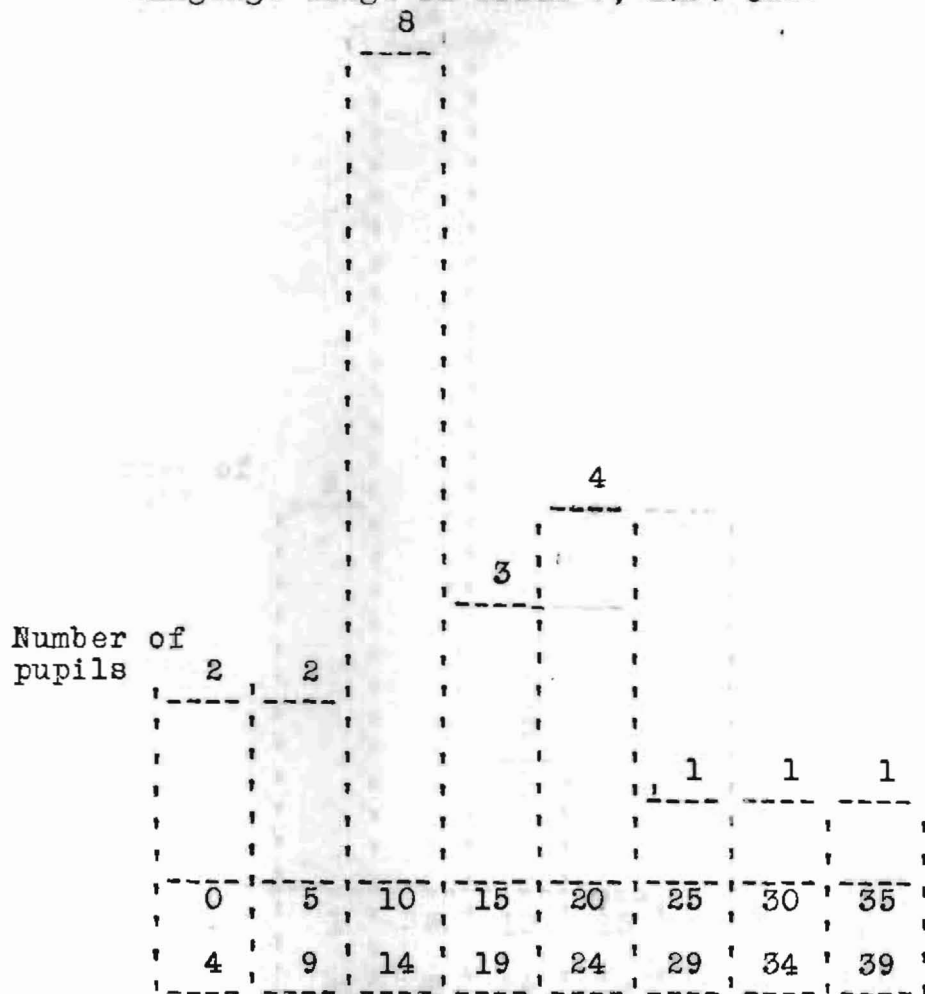
This test was used in grades V, VI, and VII, and VIII at Westland and results are shown in Figures XVII to XXIV by means of column diagrams, and in tables C to CVII inclusive which show percentile scores.

Table
Percentile Scores
Pupils
101,088

Results in Grade V

Figure XVII

Results obtained in New York Survey Test,
Language Usage in Grade V, Part One.



Distribution of Scores

Table C

Percentile Scores in Part One

	Pupils	25%	50%	75%
Nation-wide Survey	101,088	8.7	15.1	21.7
Westland	22	10.5	14	21

Figure XVIII

Results obtained in New York Survey Test,
Language Usage in Grade V, Part Two.

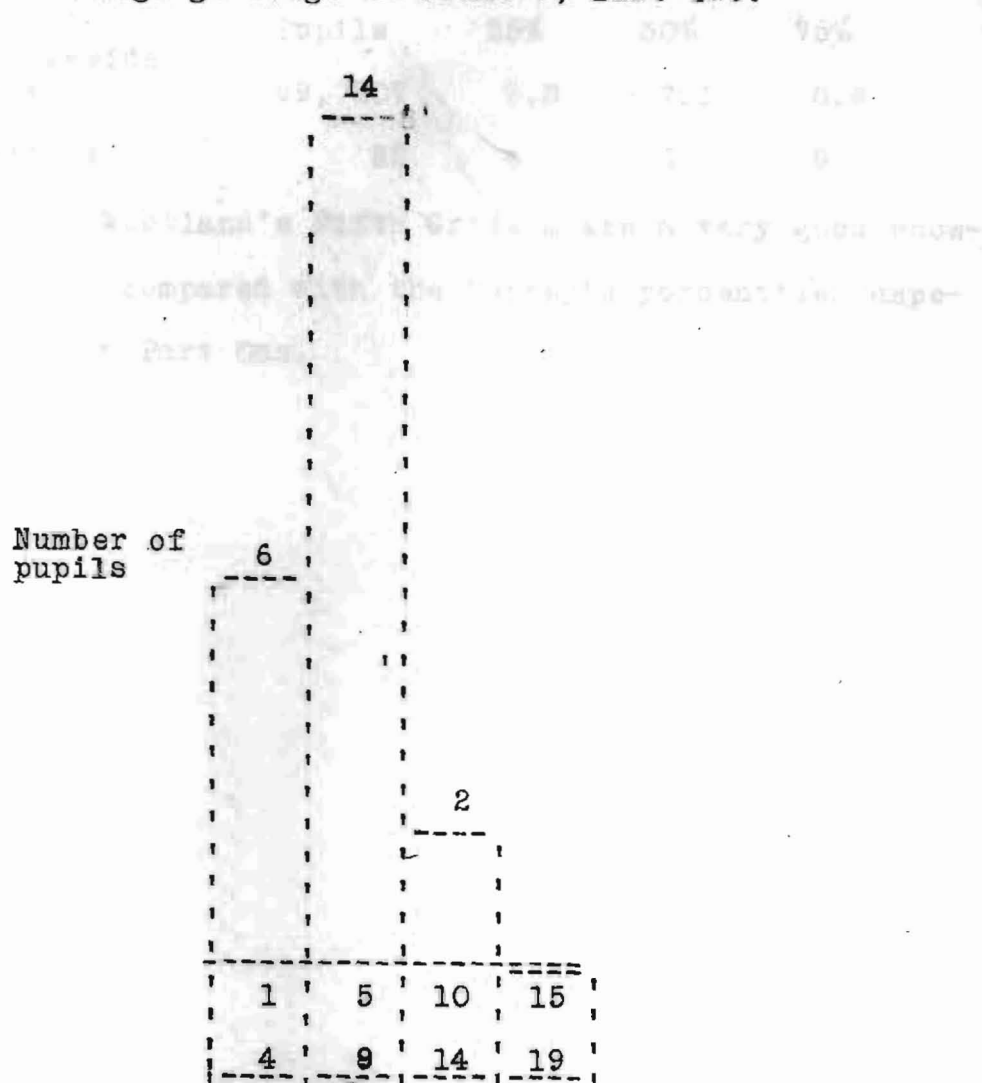


Table CI

Percentile Scores in Part Two

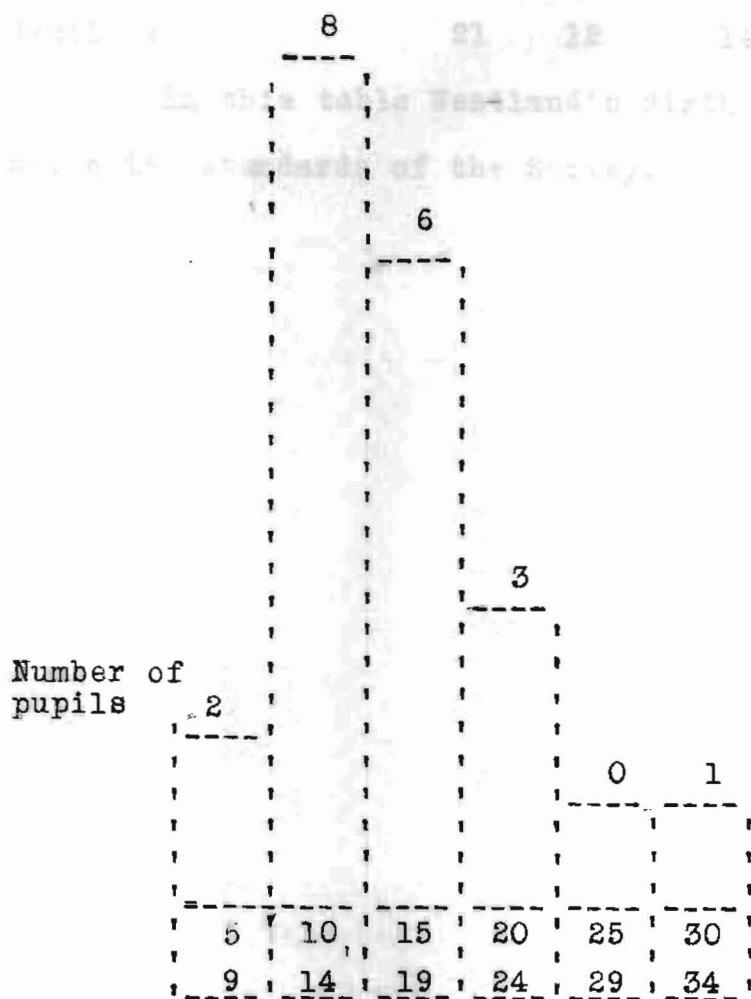
	Pupils	25%	50%	75%
Nation-wide Survey	99, 207	5.3	7.1	8.8
Westland	22	4	6	9

Westland's Fifth Grade makes a very good showing when compared with the Survey's percentiles especially in Part One.

Results in Grade VI

Figure XIX

Results Obtained in New York Survey Test,
Language Usage in Grade VI, Part One.



Distribution of Scores

Table CII

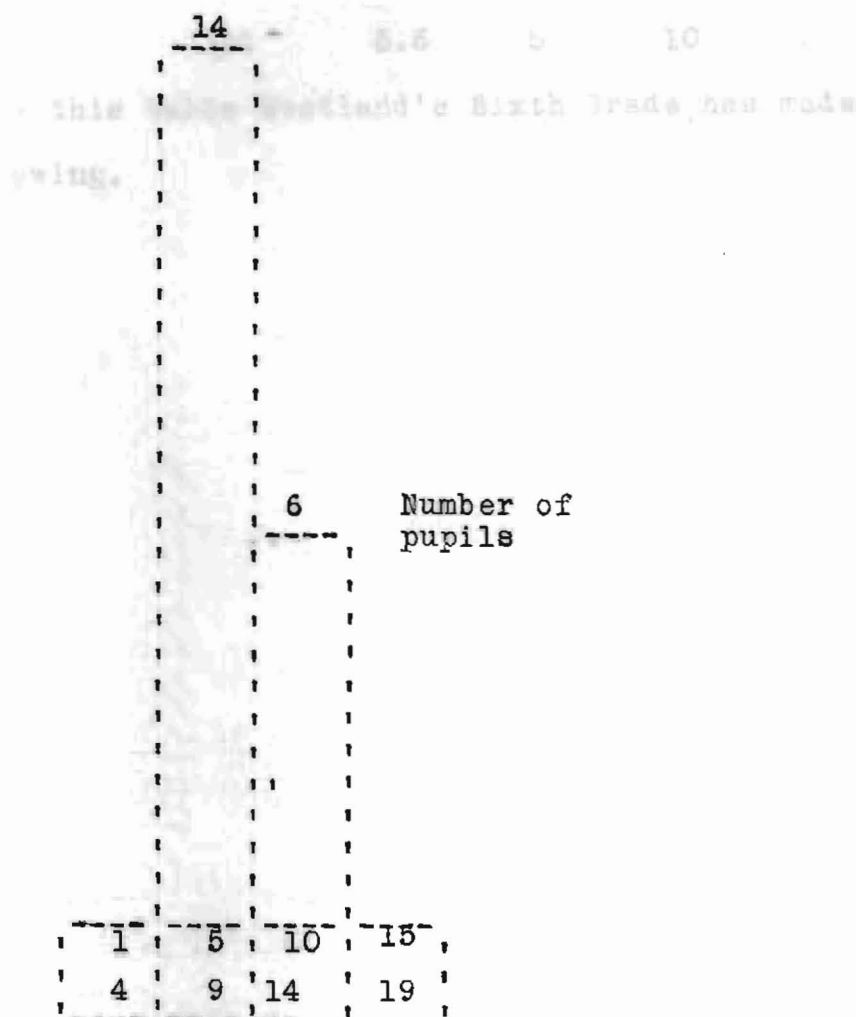
Percentile Scores in Part One

	Pupils	25%	50%	75%
Nation-wide Survey	101,088	13.5	20.2	26.1
Westland	21	12	14	18.5

In this table Westland's Sixth Grade is far below the standards of the Survey.

Figure XX

Results Obtained in New York Survey Test,
Language Usage in Grade VI, Part Two.



Distribution of Scores

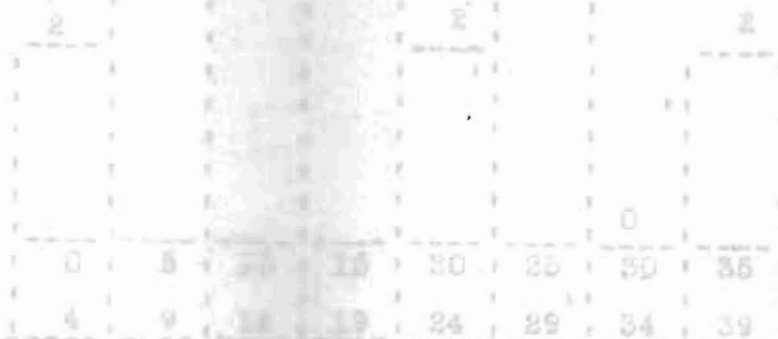
Result Table CIII VII

Percentile Scores in Part Two

	Pupils	25%	50%	75%
Nation-wide Survey	99,207	6.6	8.2	9.8
Westland	21	5.5	8	10

In this table Westland's Sixth Grade has made a good showing.

Number of 3
pupils



Distribution of Scores

Table CIV

Percentile Scores in Part One

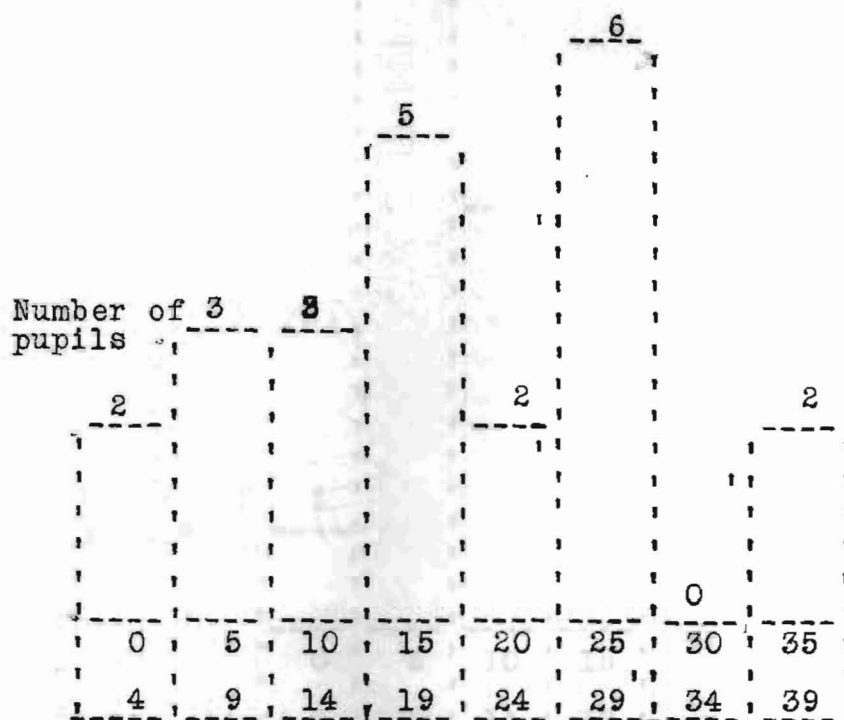
	Pupils	25%	50%	75%
Nation-wide Survey	101,088	17.7	23.9	29.4
Westland	23	12	15	26

The Seventh Grade falls far below the Survey Standards in Part One.

Results in Grade VII

Figure XXI

Results Obtained in New York Survey Test,
Language Usage in Grade VII, Part One



Distribution of Scores

Table CIV

Percentile Scores in Part One

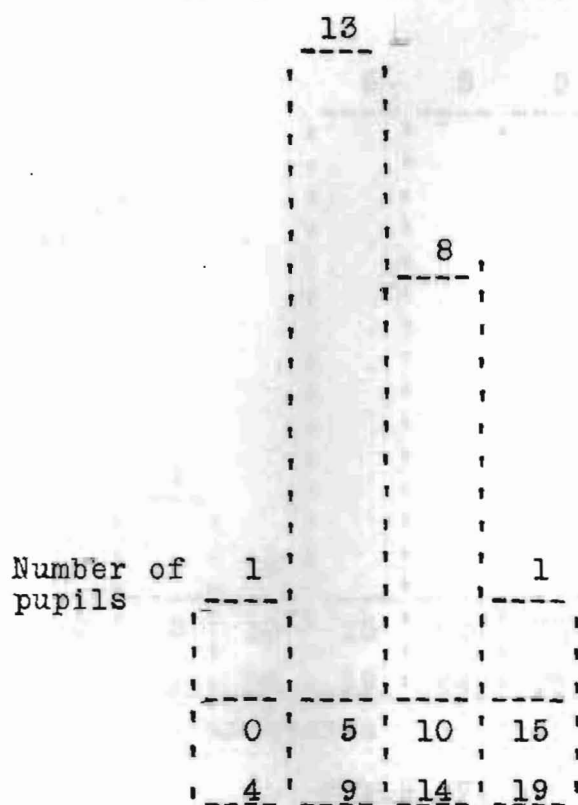
	Pupils	25%	50%	75%
Nation-wide Survey	101,088	17.7	23.9	29.4
Westland	23	12	18	26

The Seventh Grade falls far below the Survey Standards in Part One.

Figure XXII

Results Obtained in New York Survey Test,
Language Usage in Grade VII, Part Two.

Results Obtained in New York Survey Test,
Language Usage in Grade VIII, Part One.



Distribution of Scores

Table CV

Percentile Scores in Part Two

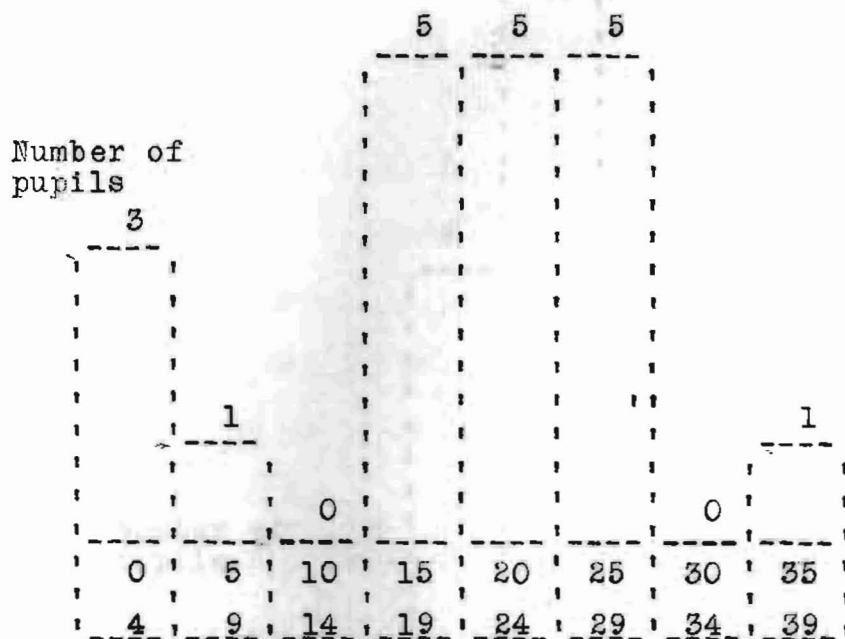
	Pupils	25%	50%	75%
Nation-wide Survey	99,207	7.6	9.3	10.9
Westland	23	6	9	10

Westland ranks very close to the Survey Standards in Part Two for the Seventh Grade.

Results in Grade VIII

Figure XXIII

Results Obtained in New York Survey Test,
Language Usage in Grade VIII, Part One.



Distribution of Scores

Table CVI

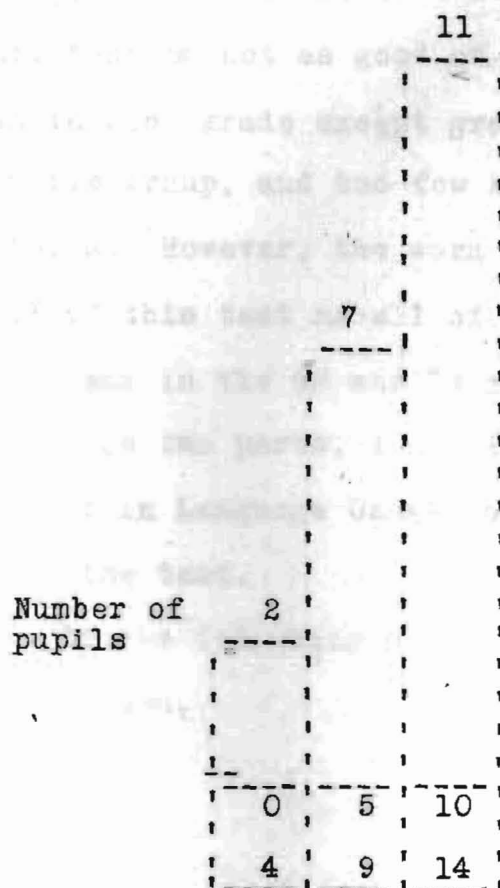
Percentile Scores in Part One

	Pupils	25%	50%	75%
Nation-wide Survey	101,088	21.5	27.4	32.5
Westland	20	16	21	26

In this table Westland again makes a very low showing as compared with the Survey standards.

Figure XXIV

Results Obtained in New York Survey Test,
Language Usage in Grade VIII, Part Two.



Distribution of Scores

Table CVII

Percentile Scores in Part Two

	Pupils	25%	50%	75%
Nation-wide Survey	99,207	8.9	10.6	12.4
Westland	20	8	10	12

Westland ranks very close to the Survey standards in Part Two for the Eighth Grade.

In the study of the work in Language Usage in the four grades studied, namely grades V, VI, VII, and VIII, it is evident that Westland's work in Part I of this test is not as good as it should be. Too many scores in each grade except grade V fall in the 25 percentile group, and too few in the 50 and 75 percentile limits. (However, the work was very much better in Part II of this test as all of the grades were on a par or above par in the 50 and 75 percentile groups.) Balancing these two parts, I and II, the work done in the whole test in Language Usage compares favorably with the norms of the test.

In the following chapter, a summary of all the tests is given.

CHAPTER V

SUMMARY AND CONCLUSIONS

Reading

In Grade IV, Westland makes a better showing in comprehension than two of the other schools, and a poorer showing than the two remaining schools, while in rate it equals the other schools.

In Grade V, Westland again takes a middle place, but leads all the other schools in rate.

In Grade VI, Westland ranks next to the lowest in comprehension, but is first in rate.

In Grades VII and VIII no data were available for the schools of Warren Township so no comparisons were possible for these two grades.

Using the median scores in rate and comprehension of each school tested and the standard medians as established by the originator of the tests used, the following conclusions are obtained:

In Grade V, Westland ranks third in rate and is decidedly below Stone's standard. (154 to 170). In comprehension, the score is the same for all schools except Lowell, which is one point below the other schools. Westland is one point below Stone's standard. These re-

sults show that Westland's Fifth Grade is low in reading ability.

In Grade V also, Westland ranks third in comprehension and is two points below the median of the test. Since this class ranks so high in rate and so low in comprehension, an effort should be made to secure a closer relation between these two features. As this was the first time the class had taken such a test, some of the pupils may not have followed the instructions carefully enough when reading the number cards. This might account for such a low rate. Some evidence of this was noticeable on one or two answer sheets.

In Grade VI, Westland leads all the other schools in rate, being forty-five points above Stone's median. In comprehension, Westland ranks next to the last and is three points below the median in the test, which indicates that this class reads too hurriedly and too superficially. The pupils seem to be racing and not trying to acquire the points of the story. Greater emphasis needs to be placed upon an endeavor to understand what is being read.

In Grade VII, Westland leads in rate and is twelve points above Stone's median. In comprehension, it ranks last and is two points below the median of the test.

In Grade VIII, Westland ranks third in rate and is seventeen points below Stone's median. In comprehension, it ranks last and is five points below the median of the test. This class is low in both rate and comprehension.

Arithmetic

In the Third Grade comparisons in Arithmetic were made as follows:

First, on the median number of problems attempted in each of the six tests given.

Second, on the median number of problems solved correctly in each of the tests given.

Third, on the number of pupils solving correctly all problems attempted in each of the six tests.

Fourth, on the number of pupils who solved no problems.

Westland's Third Grade ranked third in the first, second in the second, third in the third, and first in the fourth comparison.

From a summary of all rankings Westland obtains second place. When the median score for the whole Grade is compared with similar scores of the schools of this comparison, Westland ranks first. When the median score for the whole Grade is compared with that of Monroe's

Standard, Westland is 3.7 points above.

Hence, the conclusion may be justly made that any adverse criticism of the achievements in Arithmetic by Westland's Third Grade is not based on facts, and such criticism is unjust to the school and to the teacher of this Grade.

By comparing the results of each table, the following conclusions were reached:

In Grade IV, Westland ranked second among the schools tested, with Township in first place.

In Grade V, Westland ranked fourth, with Township second, and Shadeland first.

In Grade VI, Westland again ranked fourth, with Shadeland second, and Township first.

Since all Seventh and Eighth Grade pupils of Warren Township are consolidated into one school, that of Township, the comparison for these two Grades can only be made between Westland and Township. The latter, however, has divided each of these classes into three groups A, B, and C, which makes the comparison somewhat easier and more readily intelligible. In this comparison of the four classes, Westland secures fourth place in the Seventh, and third place in the Eighth Grade.

Since Township has made mental ability the basis for dividing these grades into three classes, and

since Westland ranked below Township's lowest group in Grade VII, and was able to surpass only Township's lowest class in Grade VIII, its showing would seem to justify at least a part of the criticism that is made against the school. The further fact that Grades V and VI made poor showings in comparison with the other schools may be used in support of the claim of the patrons that the Arithmetic work in Westland is not as good as that done in schools of similar type.

But there is another side to this criticism. In a comparison of the median scores for each Grade of each school with median scores established by Professor Monroe, the following results obtain:

In Grade III, Westland ranks first and is 3.7 points above the Standard median.

In Grade IV, Westland ranks second and is 12.6 above the Standard median.

In Grade V, Westland ranks fourth and is 4.5 points above the Standard median.

In Grade VI, Westland ranks third and is 9 points above the Standard median.

There is a conflict between this comparison in Grade VI and the one formed from the tables given in Chapter II. By the tables, Westland made a poor showing in Grade VI, and yet this Grade's median score is

9 points above the median established by Professor Monroe. Since the author of this test has given it to so very many pupils of this Grade in order to establish his median, it is much better statistically to take his median as a measure of achievement than to take the medians of the scores of three or four schools.

As stated in Chapter Two, median scores for the Seventh and the Eighth Grades at Township were not available, so in these Grades, Westland's median scores are compared with Professor Monroe's medians only. In Grade VII, Westland falls 4 points below the Monroe median, while in Grade VIII the median scores are the same.

Summarizing these conclusions, it is noticeable that three Grades, the Third, the Fourth, and the Sixth, exceeded the Monroe medians, while in the Eighth Grade the medians were the same, and in the Fifth and the Seventh Grades they fall below the Monroe medians. The Fifth Grade was also low in comparison with the other schools, securing only fourth place. However, two-thirds of Westland's Grades are doing better than standard work in Arithmetic. In view of these facts, it would seem unjust to accuse the Westland schools of doing inferior work, at least in Arithmetic.

Language Usage

In Part One, Westland school is a little below the standard of this Nation-wide Survey, but this difference is not very marked. This may be due to the fact that this was the first time these pupils had taken tests of this kind and that they were not sufficiently familiar with the method of operation. Perhaps some may not have understood clearly the instructions. However, if the instructions were understood, additional work of this character could be given with profit.

In Part Two, all Grades made scores very similar to the percentiles obtained in the Nation-wide Survey.

Since the margin of difference against the work of Westland school is so small in Part One and the scores in Part Two are so nearly identical with the Survey scores, it must follow that the work done in Language in the Westland school cannot be justly condemned. Any adverse criticism in this department of work cannot be based on the facts presented above and, therefore, should not be considered seriously. On the other hand, there is a considerable measure of satisfaction in knowing so definitely and fully that the work of the pupils in these Grades at Westland compares favorably with similar work being done in the schools covered by the Nation-wide Survey.

Finally on the basis of Westland's achievements in the subjects compared in this study, the adverse criticism made by the patrons of the Westland school is not justified.

APPENDIX

APPENDIX A

APPENDIX A
SILENT READING.

APPENDIX B

ARITHMETIC

APPENDIX C

LANGUAGE USAGE

APPENDIX C